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In THE MUNICIPAL INDEX (an 875-page annual volume published by American City Magazine Corporation) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY.

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In DETROIT Michigan

more than 800 miles of DeLavaud Pipe are now in service

Detroit is known throughout the world as the headquarters of the automotive industry. Those acquainted with the city will also tell you of its wide streets and beautiful buildings—particularly the new Masonic Temple (shown above). Detroit's city engineers will doubtless emphasize their modern water system and the marked success which they have been experiencing with deLavaud Pipe. A recent check-up shows that today 803 miles of deLavaud Pipe, in sizes from 6 to 16 inch, are in use throughout the city.

DeLavaud is the modern pipe for modern conditions. Not only is it at least 25% stronger than pit cast pipe, but it is lighter in weight and thus more economical to handle and install. DeLavaud Pipe is extremely satisfactory to cut and tap too. And it offers a greater carrying capacity for the same outside diameter.

DeLavaud Pipe is centrifugally cast in an accurately machined mold. The uniformity of the pipe wall and the even grain structure of the metal are assured by the laws of science. To improve further the toughness of the metal, every length is placed in a furnace where annealing temperatures are accurately controlled.

The deLavaud Handbook gives complete information and detailed specifications. Write for free copy.

The self-centering shoulder in the deLavaud bell eliminates the requirement of a lead. In laying deLavaud pipe it is only necessary to place the spigot of one pipe within the bell of the next, sliding the pipe forward until it rides upon the taper and automatically centers itself.

United States Pipe and Foundry Co., Burlington, N.J.

Sales Offices: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

Cut Red Tape—Push Public Works

Urged by President's Committee on Employment Plans

The Municipality's Opportunity for Immediate and Practical Unemployment Relief

THAT nothing be omitted to make immediately available new additional employment represented by public work already authorized and appropriated for, but delayed or blocked by removable legal obstacles and supervisory red tape, is strongly urged in a report made public on October 29 by the Committee on Employment Plans and Suggestions of the President's Organization on Unemployment Relief.

In its conclusion on this recommendation the Committee says:

"Next to expansion of industry, private and public, the most extensive source of immediately available additional employment is to be found in the various types of public works, already authorized and in many cases already appropriated for.

"There is hardly a state and few industrial districts which have not in abeyance extensive programs of public improvement for which in many cases all the preliminary authority and financing has been completed. These projects remain dormant, however, because of obstacles usually describable by the term 'red tape.'

"In some cases it is only the requirement, entirely justified in ordinary circumstances, that a certain period elapse between initial proposal and final approval; in others it comprises a too meticulous reading of statutory limitations which, again, are plausible and desirable only under normal conditions; in still others the delay results from interference by partisan or otherwise specially interested groups who take advantage of slow legal processes in the raising of minor or inconsequential points to compel adoption of their selfish views.

"The multiplied effect of immediate distribution of the employment bound up in these projects upon the urgent program for relief during this winter, the Committee feels, justifies its reiterated recommendation that purposeful action be taken to cut through the technicalities which hold them bound.

"The Committee believes support should be given every proper effort to expedite Federal construction.

"In the case of projects, Federal, state and municipal, already authorized, in order to permit and insure earliest possible decisions upon questions which prevent or delay actual construction operations, it may be necessary to ask that executive orders be issued relieving bureau chiefs and subordinates from strict application of rules and regulations now restricting inititative and inducing, if not compelling, unnecessary time-consuming routine.

"Contractors on government operations should recast their labor schedule to permit staggered employment in the journeyman and laborer classifications, and to seek in their turn similar action by subcontractors, both at the building site and in the shop where materials under those contracts are being prepared.

"It is recognized that supervisory and foremanship forces cannot be so staggered or rotated, but the application of that principle to other classifications seems entirely feasible and completely certain of material result. This is directed also to the attention of Governors of the several states and to municipal authorities as equally applicable to public work under their jurisdiction.

"The Associated General Contractors of America, the employers' associations in large cities, and trade associations generally which have contact with the construction industry, can be expected to assist willingly and effectively.

"The American Federation of Labor, whose endorsement already has been given in some cases where the principle was involved, also can be expected to support this plan for increasing work-opportunity.

"As in the cases of most of the separate suggestions in this report, we have here again an opportunity, not only for immediate and practical relief of the current effects of depression, but at the same time an opportunity to contribute to the permanent foundation of a constructive restoration of prosperity.

"The actual provision of new employment through release of public works must have a healthy repercussion upon the program for resumption of normal buying. The psychological effect upon wide working groups to that end cannot be anything but healthful and helpful."

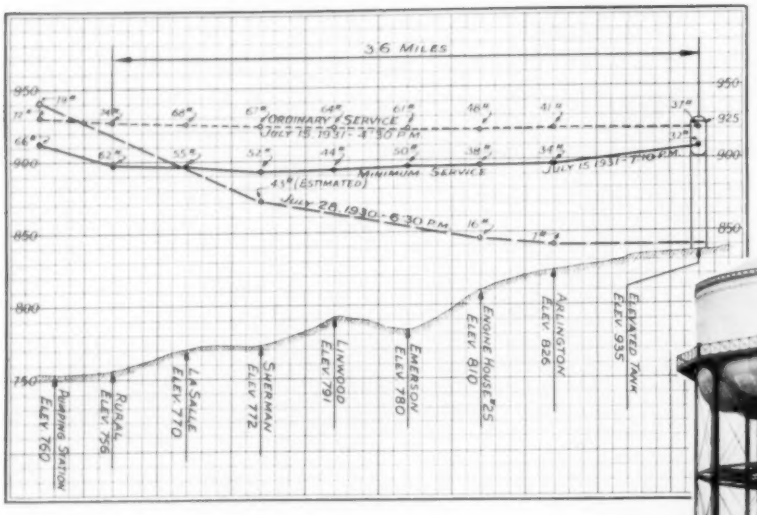
Practical City Jobs for the Unemployed

THESE are times when it is possible to make our vision of a beautified, clean city take on reality. The unemployment emergency offers wide opportunity for getting the city's odd-jobs done, at reasonable expense and with great benefit to the general welfare. The President's Organization on Unemployment Relief (Fred C. Croxton, Assistant Director) has pointed out that "made" work, in addition to the regular public works programs already contemplated, not only will render many unemployed persons self-supporting and self-respecting, but will mean the development of public improvements which might otherwise have been postponed indefinitely. A high degree of planning is necessary at the outset in order that the work given out may be useful, and competent supervision is necessary to insure good work and equitable distribution of jobs among the unemployed. The organization believes that relief funds applied to made-work programs should, so far as possible, be used for wages; and that tools, materials, transportation, land, and other costs should be borne by the municipality or donated.

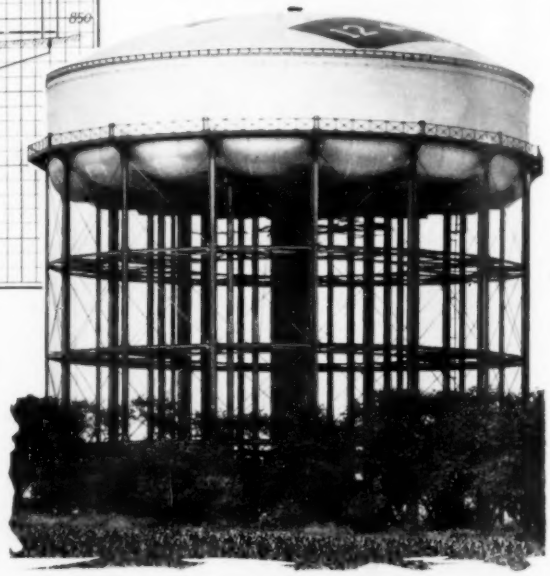
In its many discussions of means of unemployment relief, THE AMERICAN CITY has given specific instances of citizen cooperation in providing jobs: home modernization embraces many such, illustrated by Glen Ridge, N. J., in "getting down to brass tacks" last winter (see p. 142, March, 1931) and by the man-a-block plan that eliminated bread lines in Buffalo, N. Y. The same sort of ingenuity and imagination can be used by municipal officials in modernizing city housekeeping by using the present great supply of available workers. Large public works programs are being carried out, and now, also, is the time for the city's smaller, made-work projects. Can your city not get busy on some of the following typical jobs, listed by Mr. Croxton's office?

1. Eliminating hazards on local highways:
   a. Straightening bad turns on secondary roads
   b. Painting telephone poles, fences, etc.
   c. Clearing brush and other obstacles to visibility
   d. Filling ditches and laying tile drains
2. Beautifying approaches to the city:
   a. Clearing rubbish
   b. Planting trees
   c. Painting, etc.
3. Clearing streets, alleys, and vacant lots
4. Improving the beauty or accessibility of historical spots
5. Making new roads
6. Making a municipal golf course
7. Clearing and grading in public parks
8. Painting and repairing public buildings
9. Construction of small buildings, walls, foundations, etc.

Five reports on community made-work programs—in Rochester, N. Y., Chicago, Ill., Wilmington, Del., Indianapolis, Ind., and Milwaukee, Wis.—have been issued by the President's Emergency Committee for Employment (Department of Commerce Building, Washington, D. C.) and give valuable detailed experiences in the organization, administration and results of emergency action in relieving unemployment in these places.



The diagram at the left illustrates the improvement in water pressure after the Indianapolis tank (shown below) was placed in service. On July 28, 1930 (without the tank), the Michigan station pumped at the rate of 16.6 M.G.D. while on July 15, 1931 (with the tank), the same station under similar demand pumped at the rate of 8.9 M.G.D. and the tank supplied the balance at the rate of 8.4 M.G.D. The charts below show how this tank stabilized pressures. This result is typical with elevated tank installations.

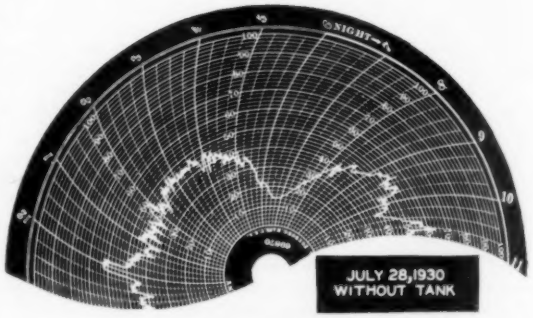


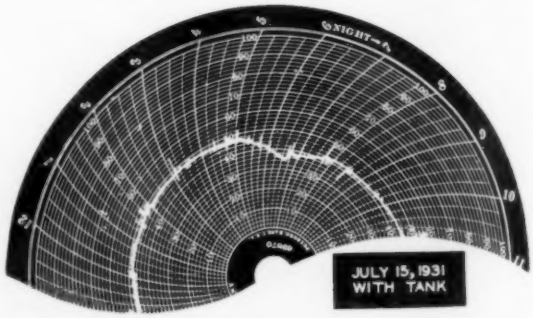
The difference between good and poor service was an elevated tank

With water pressure normally between 40 and 50 pounds you can't blame consumers for complaining when it suddenly drops to 20, 15 or even 7 pounds as shown in one location above. Of course these drops always occur when water is needed most. The data briefly presented here is only another of the many proofs that proper elevated storage can correct such conditions.

And this remedy is an economical one. In many cases new water systems using adequate elevated storage are lower in first cost than alternate systems depending on direct pumpage alone. In almost every instance, operating costs are reduced by the installation of elevated storage. In one city power costs were 35 per cent less after the addition of a tank to a municipal water system.

Horton shallow-depth tanks combine maximum improvement in conditions with maximum operating economy. They hold all the water above the effective elevation without excessive tank height. They reduce pumping costs, release pumping equipment for reserve, postpone main enlargements, etc. Our nearest office will gladly estimate the cost of a tank to meet your needs.





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Chicago.....2127 Old Colony Bldg.	Philadelphia..2616-1616 Walnut Street Bldg.	Houston.....1101 Electric Bldg.
New York.....3108 Hudson Terminal Bldg.	Boston.....1501 Consolidated Gas Bldg.	Tulsa.....2425 Exchange Bank Bldg.
Cleveland.....2236 Midland Bank Bldg.	Birmingham.....1502 Fiftieth St., N.	San Francisco.....1033 Rialto Bldg.
Detroit.....1501 Lafayette Bldg.	Dallas.....1206 Burt Bldg.	Los Angeles.....1303 Pacific Mutual Bldg.

HORTON TANKS

AC11-Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

New Tank Reduces Variation in Water Pressure

SANDUSKY, OHIO, a city of 25,000 population situated on the south shore of Lake Erie, has installed a 1,000,000-gallon radial-cone bottom elevated Horton tank to improve the pressure in its water-works system and to reduce operating costs. The tank, which is of a relatively new design, is 85 feet in diameter and 80 feet 6 inches to the bottom. The tank proper is only 22 feet 6 inches deep, making the maximum difference in head between the upper and lower levels of the tank 10 pounds. The majority of the time, however, the level of the water in the tank remains within a range of several feet.

In July, 1930, before the tank was installed, there was a pressure variation of from 18 to 20 pounds in the system. Readings taken on December 2 and 3, 1930, after the tank was in service, show a maximum pressure of 63 pounds and a minimum pressure of 58 pounds, or a variation of only 5 pounds.

The installation of the elevated tank also made a reduction in the variation of the pumping rate, which was from 7,400,000 gallons maximum per day to 2,700,000 gallons minimum, or a variation of 4,700,000 gallons per day during July, 1930. After the tank was installed, readings taken in November, 1930, showed a variation of only 2,100,000 gallons per day from a maximum rate of 4,400,000 gallons to a minimum of 2,300,000 gallons.

CHARLES GREMELSBACHER.
Superintendent of Water Works.

Operating on a Water System

THE condition of the Phoenixville, Pa., water system was very much like that of a person ill with gall stones. It ran with decreased efficiency until the operation of cleaning the mains was completed, when the system was completely rejuvenated. For 59 years tubercles had been growing larger and larger in the water mains until the system fairly groaned under the handicap of this affliction. The capacity of the pipes was so lowered that consumers began to take notice and found that when water was being drawn on the first floor of a house, none could be secured on the second floor. The menace from fire became acute owing to the shortage of water for the fire pumpers.

The reservoirs were full but for some reason or other the pipes could not carry enough water from the reservoir to the homes. Several remedies were tried: first, two miles of additional large diameter pipes were installed; second, a standpipe was erected at the opposite end of the system from the reservoir, and was connected to the new pipes. These improvements helped, but the pipe was still lying down on the job and the standpipe would not fill more than half way. Some people wondered if a mistake had been made and the standpipe placed too high.

Realizing that the pipe had been reduced in diameter because of tubercles and deposits, borough officials made a contract with the National Water Main Cleaning Company to have the pipes cleaned. Some consumers were sceptical, but after the work was completed and they saw the tons of rust and dirt that were removed from the pipes, they began to ask why the water mains were not cleaned long ago. The débris removed amounted to one ton for every hundred feet of sixteen-inch pipe cleaned. Thereafter consumers were furnished with over 12 pounds more pressure per square inch than before. The standpipe filled to capacity and the fire hazard was greatly reduced.

NORMAN G. YOUNG,
Borough Manager.

A Study of Tyhoid Fever

THE marked reduction in the prevalence of typhoid fever throughout the United States has been one of the outstanding accomplishments in public health during the past quarter of a century. This has been accomplished in cities whose sources of public water supply are polluted, largely by the intelligent installation of approved water purification plants. Although the purified public drinking water meets the accepted sanitary code, there often persists in such cities a small number of cases of typhoid fever. This fact stimulated the United States Public Health Service to undertake an extensive study of these persisting or residual cases of typhoid fever, the object being to determine if they could bear any relation to the municipal drinking water, even though it did meet the present rigid sanitary standards.

Six cities situated on the Ohio River were selected for study, both because of the polluted character of their raw water supplies and because of the excellence of their municipal purification plants.

The Ohio River is the source of the public water supply for each city. During the period of raw water consumption, the typhoid fever incidence in each city was uniformly very high in every month of the year, a seasonal distribution which is typical of endemic water-borne typhoid fever. Following the installation of the present public water supplies, the typhoid incidence promptly fell to a low rate comparable with rates prevailing in other cities in the Ohio River watershed which have had, at least since 1914, safe water supplies. At the same time, the seasonal distribution changed so that typhoid became definitely a summer and fall disease.

Ample evidence accumulated to indicate that routes of transmission of typhoid fever other than the public water supply were in all probability the more usual. Therefore, the conclusion was reached from the evidence collected that modern water purification plants, such as are in operation in the six cities studied, when properly operated and controlled, effectively eliminate the danger of contracting typhoid fever from the public drinking water even though the raw water supply be grossly polluted.

Treatment of Water at Appleton

AT Appleton, Wis., prechlorination of the water supply has been in use for the past three years. There is a retention period in the settling basins of approximately 16 hours. With this long settling period and prechlorination it has been found possible to keep B. coli absent in 10-cc. samples in the settled water. The correct amount of the prechlorine dose has been found to be three times the final dose. The settled water as it comes on the filters has no residual chlorine in it, but a residual of 0.1 p.p.m. is carried on the final dose as the water leaves the plant.

The plant operators are all taught how to make the orthotolidine test for residual chlorine. This test is made every two hours on the even hours, and the chlorine is weighed on the scales every two hours on the odd hours, so that there is an hourly check on the chlorine dose.

Proper attention should always be given to the condition of the sedimentation basins, in order to effect a good bacteria removal. In the summer months it is necessary to clean the basins at Appleton every six weeks. The number of hours of settling also has considerable influence on the bacteria removal, and after exhaustive tests on settling periods prior to the building of new settling basins, it was found that a minimum of 8 hours was needed to get a bacterial efficiency of around 95 per cent. Prior to the building of these additional basins and with only 2 to 4 hours settling, it was impossible to get a bacterial efficiency of over 50 per cent. This, of course, was without prechlorination.

The filters are washed with a 24-inch vertical rise per minute for 3 minutes, the filter beds are frequently sterilized, and the walls of the filters are kept scrupulously clean.

ARTHUR J. HALL,
Superintendent of Water Works.

Lost Lid

Broken Lug

Broken Top

MUELLER Repair Lids are made to fit any condition

The three conditions above are the only ones that can occur. MUELLER Service Box Repair Lids will successfully take care of all three.

Through the Eyes of a Waterworks Man!

"When I visit a town and see uncovered service boxes—boxes with broken, jagged edges protruding, or open boxes filled with dirt and stone, I just naturally visualize a careless, sloppy waterworks plant, and loose business management. One just naturally draws conclusions from what he sees," said a waterworks man.

There is no need or excuse for this kind of a condition—it can be remedied at small cost. The loss of a service box lid does not mean that the box has lost its usefulness and should be replaced with a new box, but it does mean that the box should be made as good—and even better than new—with a MUELLER Service Box Repair Lid at a very moderate price.

Thousands of these repair lids are in use—they made unnecessary expensive replacements, made it impossible for the repaired box to fill up with dirt, and they are on for all time unless removed with a key.

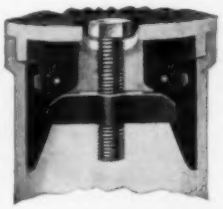
Take a census of your old or new Buffalo type service boxes and let MUELLER quote you on the necessary number of lids to make them as good or better than new. You can't make a more profitable investment, one that will add more to the looks of your equipment and shut off the expense of digging dirt out of service boxes to reach the shut off stops.

In 2½-inch sizes for new style Buffalo type service boxes, 2½ to 3-inch for old style.

MUELLER CO.; Established 1857: *Factory:* Decatur, Illinois. *Branches:* New York, Dallas, Chicago, San Francisco. *Canadian Factory:* MUELLER, Limited, Sarnia.

For New Style Buffalo Box Showing the installation of G-10373

G-10373—for new style Buffalo type Boxes, size 2½"



For Old Style Buffalo Box Showing the installation of G-10374

G-10374—for old style Buffalo type Boxes, sizes 2½" and 3"

MUELLER

Trade-mark Reg. U. S. Pat. Office

EDGAR P. KABLE
Gen. Mgr., York Water Co.
York, Pa.
(Appointed 1898)

C. J. SWEENEY
Supt., Public Works
Stoneham, Mass.
(Appointed 1916)

EDWARD J. COONEY
Mgr., Water Works
Port Chester, N. Y.
(Appointed 1927)

HANS V. PEDERSEN
Gen. Mgr., Marshalltown Water Works, Marshalltown, Iowa
(Appointed 1925)

FRANK J. BROUCEK
Supt. of Water Works
Berwyn, Ill.
(Appointed 1930)

Who's Who in Water Supply

The 46th of a Series of Portraits of Water-Works Officials Which Has Appeared Monthly Since January, 1928

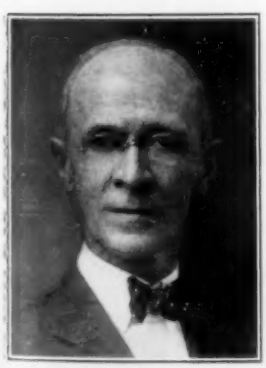
J. H. McCAMBRIDGE
Gen. Supt., Public Service Dept.
Burbank, Calif.
(Appointed 1925)

HENRY MAGNUS
Gen. Supt., Board of Municipal Works, Winona, Minn.
(Appointed 1921)

C. LELAND WOOD
Comsr., Water Dept.
Herkimer, N. Y.
(Appointed 1926)

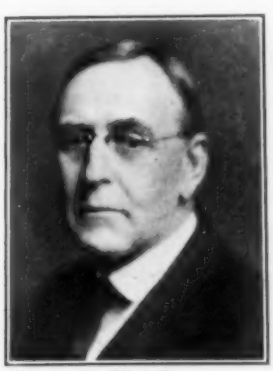
FOLKEY E. PETERSON
Comsr. of Public Works
De Kalb, Ill.
(Appointed 1939)

CHARLES C. WEST
Gen. Mgr., Sayre Water Co.
Sayre, Pa.
(Appointed 1921)



HARRY M. BEARDSLEY
Gen. Mgr., Elmira Water Board
Elmira, N. Y.
(Appointed 1915)

CHARLES C. FOUTZ
Supt., Water Works
LaPorte, Ind.
(Appointed 1926)

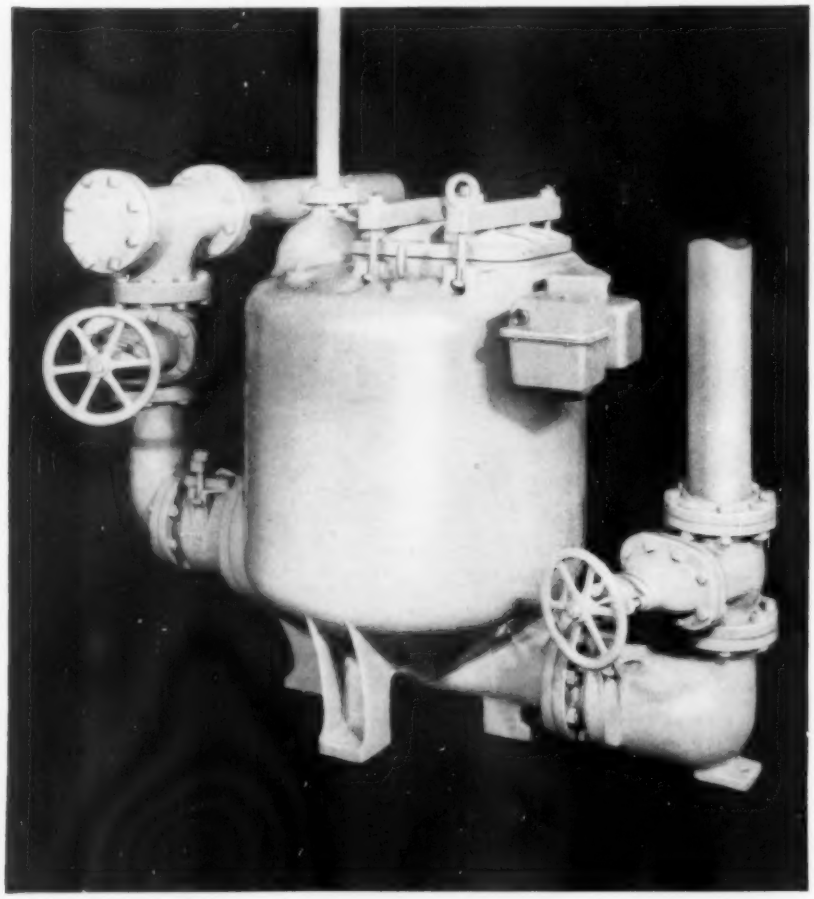


Portrait by Morrall
IRVING E. MATTHEWS
Supt., Water Div., Rochester, N. Y.
(Appointed 1926)

CHARLES L. WICK
Supt., Bureau of Water
Schenectady, N. Y.
(Appointed 1928)

PNEUMATIC OPERATION

without Air Valves—without Air Storage Tanks



Jennings Pneumatic Sewage Ejectors are furnished in capacities ranging from 30 to 1500 g.p.m. Heads up to 50 ft. Write for Bulletins 103 and 108.

IN the Jennings Pneumatic Sewage Ejector, a Nash Hytor Compressor furnishes air at the required pressure direct to the receiving pot. The compressor operates only long enough to empty the pot. Noisy, costly-to-run reciprocating compressors, air valves, air storage tanks and pressure reducing valves, always subject to leakage that wastes power and interferes with satisfactory operation, are all eliminated. ¶ Always dependable, the Jennings Pneumatic Ejector makes an ideal unit for such services as handling sludge at the treatment plant or pumping unscreened sewage in booster stations where there are no attendants to supervise operation. It is automatically controlled, good for years of service, and requires a minimum of attention.

NASH ENGINEERING COMPANY, 14 WILSON ROAD, SOUTH NORWALK, CONN.

Jennings Pumps

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Catch-Basin Cleaning Provides Added Employment

IN Nutley, N. J., during the past year it has been the practice to clean all catch-basins by hand as a means of furnishing employment for the street cleaners who were thrown out of their regular work through the acquisition of a machine that is now used for street sweeping. No accurate cost record of catch-basin cleaning has been maintained during this period.

All the catch-basins are cleaned at least three times a year and about 100 loads of débris are removed. This material is used to fill in swamp land for the eventual creation of a new park.

CHARLES A. SHERWOOD,
Commissioner, Director of Public Works, Parks and Public Property.

Removal of Oils from Sewage Tanks by Aeration

OILS and grease wastes which are emptied into sewers, intentionally or unintentionally, are a nuisance to the sewage-works operator. At Pasadena after various schemes had been tried, a process of aeration based on the method used by Karl Imhoff was tried. A rectangular tank 10 x 32 feet with an effective depth of 3 feet was built. Norton porous plates, 1 x 2 x 12 inches, are used for aeration. These are arranged in three plate-holders, each containing 10 plates and are placed along the wall of the flowing-through side. A floating redwood baffle, 4 inches wide x 10 inches deep, with triangular blocks set on top, is used as a retainer for the grease collected. The baffle is approximately along the center line of the tank. The blocks on top of the baffle are so placed that, in plan, a triangular opening is made feeding into the grease-collection side, the opening on the flowing-through side being 4 inches, tapering to 1 inch on the collection side.

The aeration of the sewage partly emulsifies the oils and greases, so that when thrown over in back of the baffle, a light scum is formed which collects on the surface and is held in the collection compartment by the baffle and the cross-flow action caused by aeration. The sewage flow from the tank passes under the concrete wall at the discharge end into a concrete flume and then into the influent trough to the aeration tanks.

Results have been good and the skimming tank will be enlarged to at least double its size in order to obtain a greater removal of grease from the sewage. Since using the skimming tank, there has been a noticeable improvement in the amount of grease scum appearing on the surface of the aeration tank. When unusually large quantities of oil or grease have reached the plant with the sewage, and, due to lack of capacity, some of the oil passes into the aeration tanks, there is a lower standard of clarification due to incomplete aeration. The oils received on these occasions are usually fuel oils or waste oils from garages and machine shops, the dumping of which in the sewers is forbidden.

Prior to using the grease-skimming tank, it was often necessary to employ an extra crew or from four to ten laborers to skim the grease scum of the aeration tanks after a large quantity of oil reached the plant. It usually required several days to accomplish this and the effect was noticeable for several days thereafter. An estimate of the cost of grease skimming prior to the construction of the skimming tank is $1,200 to $1,500 per year. Since using the tank this expense has been eliminated, the regular crew being able to care for any skimming still necessary.

—From a paper by William A. Allen, Assistant Superintendent, Pasadena Sewage Treatment Plant, presented before the Third Annual Meeting of the California Sewage Works Association.

To Cover or Not to Cover the Sludge Beds

TO cover or not to cover sludge beds is the question. The admitted advantages of open beds are: less construction cost per unit of area; no maintenance cost of a comparatively fragile superstructure; no operating cost for artificial heat, and no insurance. With covered beds there is less area per capita, hence greater capacity where space is limited; more frequent drawings due to protection from inclement weather; less chance of nuisance if the sludge is not properly digested; and better appearance, if the beds are close to dwellings.

The cost of open beds is from $0.50 to $1.00 per square foot, with an average of $0.75. The cost of glass-overs as received from four manufacturers runs from $0.75 to $2.00 for standard plain construction, including gable ends, sides, windows and doors, and may be assumed at an average of $1.50 per square foot, or twice the cost of the remainder of the bed. If covered beds are three times as expensive as open beds, one might expect of them three times as many fillings per year, or, in other words, one-third the area. New York State Health Department rules allow one-half the area if beds are glazed.

With Imhoff tanks, unheated, 20 sludge drawings in 8 months would be a fair estimate for covered beds, whereas there might be 30 drawings for a 12-months period from heated digestion tanks if the sludge could be economically handled upon removal from the beds. There would be little economy if it had to be stored and then rehandled.

The cost of land available for sludge beds may also dictate whether they should be covered or not. There will probably be some maintenance cost on a glass structure due to the damage other than by the elements, for in isolated places or near railroad tracks glass offers a shining mark for missiles. Insurance, too, is expensive, the rate being $3.00 per hundred with 50 per cent co-insurance. Some covered beds with high concrete walls give one the impression of having been constructed with the object of sweating the sludge rather than drying it. The less wall the better, and the cheaper. If the expense of artificial heating is not contemplated, the best possible ventilation is required.

Various figures supplied by manufacturers indicate that the cost of covers can be reduced from $0.14 to $0.20 per square foot of bed if side and gable ends with ventilators, windows and doors are omitted. A glass roof furnishes protection from rain and snow, lets in the sunshine and provides the maximum of ventilation. In a plant for a growing community, provision should be made for liberal drying-bed space for the ultimate capacity of the plant, but saving may be effected temporarily by constructing beds for the present population, then increasing the capacity by enlargement or covering, or both.

Abstract from a paper by JOHN F. SKINNER, President, N. Y. S. S. W. A., consulting engineer, Rochester, N. Y., presented before the New York State Sewage Works Association.

Shore Resort Has New Treatment Plant

WITH the completion recently of the new sewage disposal plant at Spring Lake, N. J., the number of shore communities which have complied with the new standards set up by the New Jersey Department of Health has been increased to fifteen, leaving only four municipalities along the shore with systems which do not meet with the approval of the Department.

The Spring Lake system, which cost $200,000, is designed to provide for a population of 25,000, which is more than ample for present needs. With the exception of a small building which houses the operating mechanism, the entire plant is below ground level.

After treatment, the clear effluent is discharged daily into the ocean at a point 1,200 feet from the mean low-water mark. This is 200 feet beyond the minimum which present state regulations have substituted for the old practice of disposing of sewage only 500 feet from shore.

MYRON O. MORRIS,
Borough Clerk.

THEY TAKE NO CHANCES WITH EROSION!

Forward-Looking Cities *Choose*

ARMCO

PAVED INVERT

Storm Sewers

Storm sewer of fully coated Armco Paved Invert Pipe, installed 1929, Jamestown, New York

STORM SEWER ideas are rapidly changing. America's most forward-looking cities are installing storm sewers of Armco *Paved Invert* Pipe.

The economy factor responsible for the trend is this: *Paving the Invert* with a bituminous material enables the structure to withstand erosive hydraulic traffic—the wearing of sand, silt, stones and boulders—thereby giving it longer life of service, free from trouble at lowered per-year cost.

Years of research and tests conducted by Armco brought these facts to light. Since then, Armco Paved Invert Pipe has had years of actual in-the-ground service. This, the final test, proved conclusively that storm sewers of Armco Paved Invert Pipe are a safe, economical drainage investment, as attested by thousands of installations throughout the country.

Take no chances with Nature's most deadly weapon—EROSION. Get the latest facts and data on Armco Paved Invert Storm Sewers, interestingly set forth in a new booklet which is yours for the asking. Clip and mail the coupon today.

Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill Company and always bear its brand

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Address.....

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Lay Armco Paved Invert Pipe this winter. Keep more men at work.

Construction and Maintenance

Engineering and Highway Departments

Model Detailed Specifications for Municipal Construction

OF great service to the city engineers of New York State cities is the set of standard specifications and contract forms for use in municipal construction work, which has recently been issued by the Bureau of Training and Research of the New York Conference of Mayors. These specifications cover grading, kinds of materials used, types of paving, sidewalk construction, sewer construction, water-main construction and some special structures and operations.

They were prepared by a committee representing the New York State Association of City and Village Engineers, which, recognizing the importance of proper specifications for municipal work, appointed this committee to prepare model specifications. The committee, consisting of Joseph B. Shaw, City Engineer, Utica, N. Y., Chairman, Pascal Dietrich, City Engineer, Niagara Falls, N. Y., and Joseph Tehan, City Engineer, Auburn, N. Y., examined in detail the specifications used generally in municipal construction work in New York State.

The report of the committee consisted of : (1) proposal and contract forms, including instruction to bidders, general requirements between the city and the contractor, guarantee and contract bonds; and (2) detailed specifications for general municipal construction. The report was turned over to the Bureau of Training and Research by the Association, so that it might be printed and distributed to municipal engineering departments in New York State. In order to obtain an adequate review of the material and further suggestions, the proposed specifications were submitted to three well-known municipal engineers, Philip A. Beatty, Staff Engineer of the Philadelphia Bureau of Municipal Research, Philadelphia, Pa., Frank R. Lanagan, City Engineer, Schenectady, N. Y., and Nelson F. Pitts, City Engineer, Syracuse, N. Y., who reviewed the report carefully. Their suggestions were studied by the committee and incorporated in the revised report.

The model proposal and contract form is a pamphlet, while the detailed specifications are a separate loose-leaf volume. This form was decided upon because the detailed specifications are subject to modification and change. Committees of municipal engineers will be formed to continually revise these specifications as new developments require. Any changes or additions will be made in loose-leaf form to replace the old ones. The specifications are available only for New York State cities, but similar work might well be done by municipal leagues in other states.

E. D. GREENMAN.

Modern Low-Cost Skidproof Surfaces for Country Roads

AFTER several years of research in cooperation with the United States Bureau of Public Roads and various state road building departments, The Asphalt Institute has prepared a manual describing in detail methods of constructing two modern low-cost types of skidproof road-mix surfaces for country roads capable of carrying a traffic volume up to 2,000 vehicles per day.

The outstanding features of these road-mix types are, first, that the gravel or stone and the asphalt are mixed on the roadway, thus utilizing all the available material and eliminating long hauls; second, that the mixture thus obtained is spread and compacted while cold, thus obviating the costly heating of material; and, third, that the granular or fragmentary gravel or stone aggregates, after compaction, form a surface of somewhat open texture, thus affording a good grip by automobile tires at all times. These types of pavement are slightly resilient, and the wear on tires negligible.

Gravel roads are treated under the designation of "the graded aggregate type," construction of which is fully described in the new manual, while old macadam roads are improved and new surfaces are provided as described in the manual under the title of "the macadam aggregate type." Excessive crowns are everywhere eliminated, and all curves are banked. These improved types have been tried out with satisfaction by the State Highway Departments of Massachusetts, West Virginia, Indiana, Kentucky, Arizona, California, Colorado, Montana, New Mexico, Oregon, Virginia, Wyoming and Wisconsin. Vermont is trying them out this season. Costs for either type, in different localities, according to the proximity of aggregate materials and the labor costs, etc., range from $2,500 to $6,000 per mile, while the maintenance averages only about $300 per mile per year thereafter.

Projected 1932 Highway Expenditures

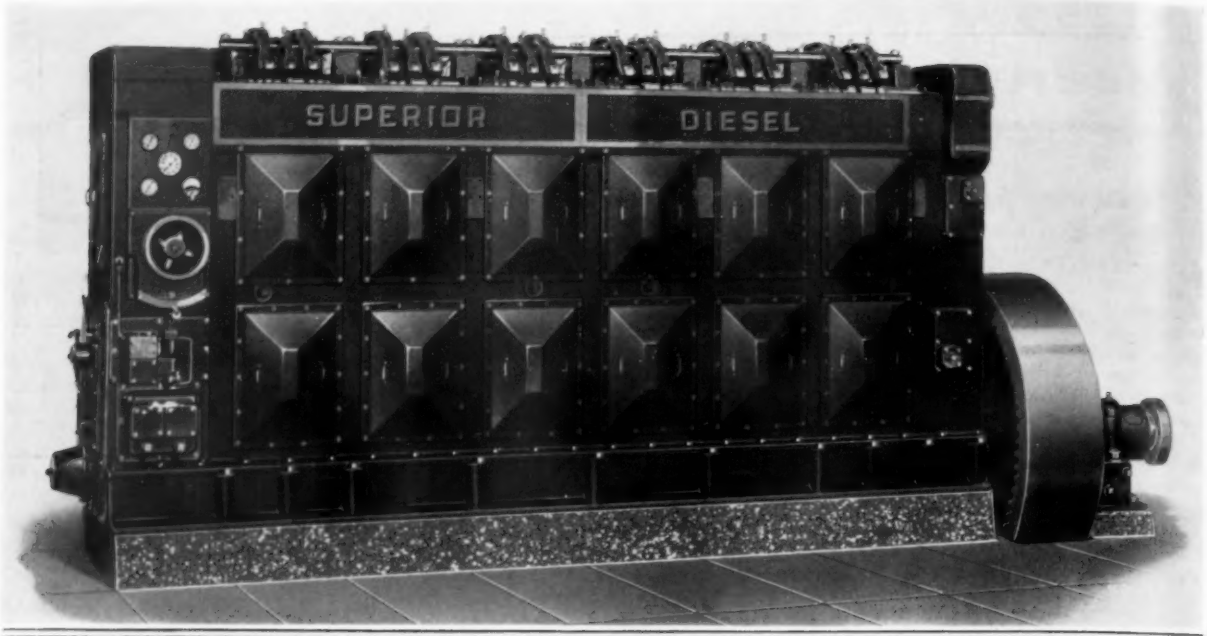
THE estimate of expenditures for state highway construction in 1932, together with the expected increased Federal aid and emergency fund, will amount to approximately the same sum that has been expended during 1931, according to a report of the American Road Builders' Association. The following table is made up from information received from all but four of the State Highway Commissions and may be considered authentic. For the four states from which no information was received, the figures used for 1932 are the same as for 1931 (indicated by asterisks). The reported amounts will undoubtedly be increased, as during the past few years the actual amounts spent have always been somewhat in excess of the estimates. Nine states have increased their gas tax rates during the past year, which means additional income for use in the highway program. Information received by the American Road Builders' Association from 128 cities indicates that there also will be some increase in municipal expenditures for 1932.

COMPARISON OF ESTIMATES OF STATE HIGHWAY EXPENDITURES FOR 1931 AND 1932

State	1931	1932
Alabama	9,695,000	9,695,000*
Arizona	7,950,000	4,642,000
Arkansas	18,000,000	18,000,000*
California	34,000,000	34,000,000
Colorado	9,797,000	6,050,000
Connecticut	15,125,000	15,300,000
Delaware	2,410,000	2,050,000
Florida	12,000,000	12,000,000*
Georgia	18,000,000	19,200,000
Idaho	6,540,000	5,150,000
Illinois	50,500,000	42,000,000
Indiana	25,000,000	19,900,000
Iowa	27,600,000	35,600,000
Kansas	14,300,000	10,500,000
Kentucky	25,000,000	17,750,000
Louisiana	64,700,000	30,000,000
Maine	15,115,000	14,000,000
Maryland	13,815,000	12,750,000
Massachusetts	25,000,000	17,000,000
Michigan	35,690,000	30,250,000
Minnesota	30,500,000	21,500,000
Mississippi	6,100,000	2,500,000
Missouri	41,354,000	31,905,000
Montana	7,000,000	6,300,000
Nebraska	13,000,000	9,500,000
Nevada	3,000,000	2,550,000
New Hampshire	5,500,000	6,000,000
New Jersey	40,500,000	41,500,000
New Mexico	6,000,000	4,500,000
New York	60,000,000	57,000,000
North Carolina	11,000,000	13,500,000
North Dakota	5,000,000	4,120,000
Ohio	34,000,000	27,000,000
Oklahoma	16,000,000	16,500,000
Oregon	10,500,000	7,500,000
Pennsylvania	60,000,000	60,000,000
Rhode Island	4,300,000	4,000,000
South Carolina	20,700,000	22,000,000
South Dakota	6,500,000	5,500,000
Tennessee	12,000,000	12,000,000*
Texas	45,200,000	47,000,000
Utah	5,000,000	9,000,000
Vermont	5,100,000	4,359,000
Virginia	21,000,000	19,000,000
Washington	14,400,000	12,750,000
West Virginia	20,800,000	9,820,000
Wisconsin	25,000,000	37,000,000
Wyoming	5,180,000	4,950,000
Total	963,871,000	884,091,000

New Highway Construction in Poland

THE Department of Public Works, Warsaw, Poland, is planning the construction or improvement of about 930 miles of highway leading to Warsaw and to other important centers; the building of 250 miles of paved asphalt-surface roads where the traffic is particularly heavy; and the surface-treating of 1,390 miles of heavy traffic routes. The program also contemplates the construction, during the next 10 years, of about 750 miles of new roads financed from annual budgets, and 235 miles from extraordinary budget funds.



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Superior Diesel Engines, with their compact design . . . extremely rugged construction . . . large overload capacity and flexible speed range are adaptable to practically any power application.

Sizes range from 35 to 800 rated horsepower, in models from two to eight cylinders . . . also smaller horsepowers built for portable and semi-portable service.

Our engineers are prepared to make a power analysis of your plant. It costs you nothing, but their findings may mean substantial savings in your power expense.

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S. J. GARGES
Comsr. of Public Works
New Rochelle, N. Y.

GEORGE H. BALLANTYNE
Comsr. of Public Works
Syracuse, N. Y.

WILLIAM D. KINNEY
Director of Parks and Public Properties, Erie, Pa.

Who's Who among Sanitation Officials

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

JOSEPH W. LA DUSKA
Supt. of Streets
Binghamton, N. Y.

FRANK M. MONTGOMERY
Comsr., Dept. of Street Improvements, Sioux City, Ia.

HENRY D. DOLGE
Asst. Supt., Bureau of Street Sanitation, Milwaukee, Wis.

JOHN S. FLOCKHART
Bureau of Street Cleaning
Newark, N. J.

SIGMUND MUENZ
Asst. Engr., Dept. of Sanitation
New York City

I. E. GOTTLIEB
Supt. of Sanitation
St. Paul, Minn.

JOHN S. HERRON
President of Council
Pittsburgh, Pa.

C. H. DEUSCHLE
Supt., Streets and Sewers
Kankakee, Ill.

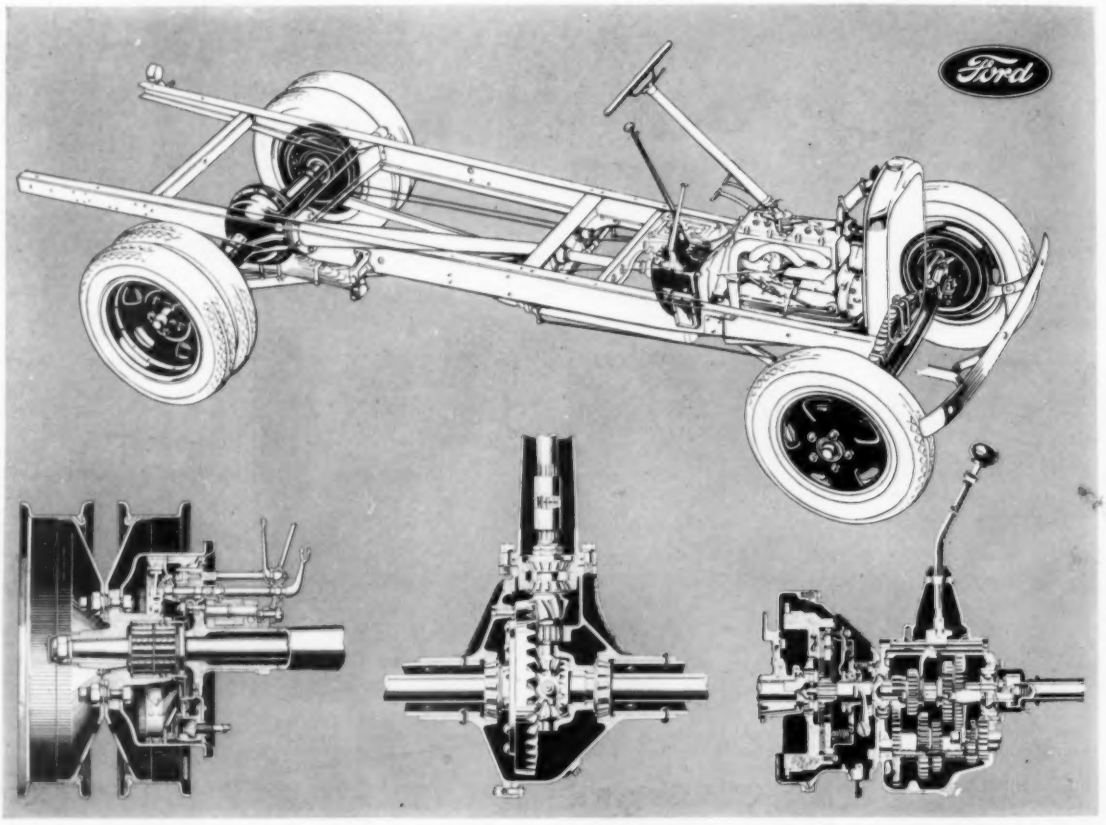
JOHN KLORER
Chief Engineer
Board of Levee Comsrs.
New Orleans

Do you realize the extraordinary value

built into the Ford Truck chassis?

BENEATH the staunch bodies with which Ford trucks are fitted lie vital mechanical features which determine the strength, reliability, long life, and ultimate economy of Ford commercial units. Many of these features are little known to their hundreds of thousands of owners and drivers—chiefly because the need to know them seldom arises. Nevertheless, they are interesting because they are the actual foundation on which Ford hauling value is based.

★ *Ford hauling-units are available with more than forty standard bodies, meeting every business need, and in forty handsome color-combinations. Your Ford dealer will gladly help you with your hauling problems. In most principal cities there are centralized exhibits of Ford commercial units.*



Three-quarter floating axle-shafts

With the three-quarter floating construction, the axle-shafts serve only to turn the wheels without carrying any of the weight of truck or load. Notice the large roller bearing. The truck weight is transmitted from the axle-housing through this roller bearing directly to the forged steel wheel hub.

The axle-shafts simply transmit the power of the engine to the wheels, a task for which they are especially designed, with their tensile strength of 180,000 pounds per square inch. The result is tremendous strength, reliability and long life.

Spiral bevel gear rear axle

Notice that the pinion-shaft is straddle-mounted; that the pinion is *between* roller bearings. This construction minimizes deflection in the propeller-shaft caused by a tendency of the pinion to force itself out of place, under load.

Abnormal strains in the steel shaft are thus eliminated, wear is reduced, and reliability added. On the inner face of the housing, there is a bronze thrust-plate which gives additional support to the ring-gear back of the point where it meshes with the pinion, insuring constant, perfect mesh.

4-speed transmission

Four speeds forward provide abundant power to climb steep grades with capacity loads, and ample speed to save time on street and highway. The transmission gears and shafts are of chrome-alloy steel, heat-treated for hardness.

Seven ball and roller bearings are used in transmission and clutch, minimizing friction and prolonging the life of these parts. There are more than twenty of these anti-friction bearings in the Ford truck chassis. In high gear, the entire drive, from engine to wheels, is carried on ball and roller bearings.

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Handling Refuse in Boise, Idaho

ALL wet garbage is kept separate from rubbish in Boise and collected by a private contractor who pays the city for the privilege. The garbage is disposed of by the contractor by feeding it to hogs on his ranch.

Rubbish is hauled by private trash collectors who are paid by the householder. The trash men also haul grass cuttings, leaves, branches and twigs from the residential area to city dumps. Boise has an unusually large number of trees for this territory, and the city gutters are filled with leaves in the fall. Many householders prefer to burn these rather than paying to have them hauled away, so that during a large part of the fall there has been a considerable smoke nuisance throughout the city from burning leaves. The Council has passed an ordinance against the practice of burning in the streets, which have recently been oiled.

W. H. RHODES,
Health Officer.

Prizes and Profit

FOR many years garbage was collected in Auburn, Maine, by local farmers who raised hogs. The city contracted with an individual to cover substantially the same ground to pick up what was not taken by the farmers. The service was poor, complaints were many, and from $2,000 to $2,500 was spent annually.

As a first step toward improving conditions, the city was divided into districts, each farmer being given a license to collect from the one district assigned to him. The collection of the remaining garbage was placed under the superintendent of the City Farm, who established a piggery with an initial herd of 50 pigs. Thus responsibility was fixed and the service greatly improved. Further, there was a slight profit at the end of the year.

The farmers did not give a consistent service, and as a result all licenses were revoked and full responsibility was placed on the City Farm. The size of the herd was increased in proportion to the amount of garbage collected, as no additional feed is ever purchased. At present there are approximately 350 hogs of varying ages. In spite of the declining price of pork during the last four years, the revenue has increased steadily, so that today all overhead and collection costs are paid and there remains an income of over $3,000 per year.

Experimentation is breeding has been going on steadily, with the result that a greater return per individual hog is gained from the same amount of garbage. Many blue ribbons and some prize money have resulted from the exhibition of some of the pigs in the State Fair held annually nearby. Sows are bred twice, the spring litters being sold and the fall litters raised. Except in special cases, it has been more profitable to turn in sows to the slaughterhouse after rearing the second litter.

The piggery is kept clean, three fields being used alternately to prevent souring. Cholera is unknown in the herd. There has never been a nuisance complaint from an owner abutting the piggery, and collection complaints are few and far between. Labor bills at the City Farm have not increased, as men and equipment are used on the Farm when not collecting. Thanks to the able superintendent of the City Farm, Rex B. Bridges, who has made himself an expert at hog raising, Auburn has eliminated its garbage question by giving a better service and realizing a profit on that service.

F. W. FORD, JR.
City Manager.

Garbage Collection by Contract

ELKHART, IND., which has a population of 32,949, pays a garbage collector $555 per month for the collection and removal of all garbage from the city. The garbage is collected once a week in the winter and twice a week during June, July, August and September. It is hauled outside the corporate limits and is fed to hogs. Hotels and restaurants have their own garbage collectors. The city does not collect rubbish or ashes, the householder being required to dispose of them himself by employing an unlicensed private collector.

MERT R. HOPKINS,
City Clerk.

Prospective Change in Garbage Collection and Disposal

AT the present in time in Ames, Iowa, garbage and refuse are collected and disposed of by a private collection agency. The entire matter of garbage and refuse collection and disposal is under active consideration by the city, and it is expected that within a few months material revision will be made in the plan of collection and disposal.

J. H. AMES,
City Manager.

Building Material a Side Product of Garbage Disposal

BY a special process, the Schoeneberger Muell-Industrie Co., of Berlin, manufactures, from the garbage of greater Berlin, building and paving block, sheathing boards and other material for the construction of houses. The process is an invention of S. W. Aretz, a Berlin chemist. The method is said to be sanitary and profitable and puts to use a material which merely means expense in most cities. The process has been studied by English and French authorities and has given satisfaction. The garbage is collected by the company with its own wagons and is brought to sorting yards, where glass, metal and other noncombustible substances are removed. These materials are later used for filling low and swampy lands in the vicinity of Berlin. About 100 tons remain and are processed in the factory daily. A mechanical sorting apparatus separates the coarse from the fine garbage. From the latter, stones are made which are in most respects equal to fine-grade bricks. The coarse garbage contains large amounts of fibrous material, from which building and sheathing boards are made. These are almost unbreakable and yet can be worked with ordinary tools. They are said to be cheaper than the usual plaster of paris or other building boards. Other products made are briquettes with from 3,500 to 6,000 B.T.U., as well as gas, tar and fuel oils.

The finished stones are said to be cheaper than natural stone and possess the advantage that nails and screws can be driven into them, as they are not brittle. The city of Berlin is chief partner in the company which operates this garbage disposal system.

Hamden, Conn.

A CONTRACTOR paid by the city collects all of the garbage of Hamden, population 19,020, using two 3½-ton trucks. The contractor sells the garbage to a privately owned piggery, according to George W. Warner, Town Agent.

Hartford, Conn.

THE garbage of Hartford, population 164,072, is collected by city employees and licensed collectors. The city uses 10 wagons, and the licensed collectors 70 wagons. Garbage collected by the city is used in a sanitary fill and the licensed collectors feed the garbage which they collect to hogs, according to Leon F. Peck, Superintendent, Department of Streets.

Bloomington, Ill.

THE city of Bloomington, population 30,930, uses 10 wagons 5 feet 4 inches wide, 10 feet 6 inches long, and 28 inches deep, for the municipal collection of garbage throughout the city. The garbage is disposed of by dumping into abandoned gravel pits outside the city, according to Charles W. Woizeski, garbage inspector.

"A Box a Block"

GIVES STATESVILLE, N. C.

96%

BOX ALARMS

CITY OF STATESVILLE
STATESVILLE, N. C.

September 21, 1931.

The Gamewell Company,
Newton, Massachusetts.

Gentlemen,-

It is a pleasure to hand you a statement in regard to our Gamewell Fire Alarm System, which as you know is a "Box in every Block" in our city. We have 100 boxes in our city which has a population of ten thousand four hundred ninety one (10,491). Will say we have in the past 12 months had 103 alarms, of these alarms ninety six (96) % came in over the system.

We are more than pleased with the Gamewell System, and would not think of going back to the old system of telephones. It might be interesting for you to know that our fire area is approximately thirty nine hundred acres.

Yours very truly,

A. Cooper

CHAIRMAN OF FIRE COM.

Statesville, N. C., offers another fine example of what adequate fire alarm box distribution will do for a fire department. Three years ago when that city installed its first fire alarm system, the officials decided that if they were to receive the full benefit from their investment, an adequate number of fire alarm boxes would have to be installed.

Accordingly, it was decided to install a box on every block so that a person discovering a fire would know instantly that a box could be found on the nearest street corner. One hundred Gamewell boxes of the Peerless non-interfering and succession type were distributed throughout this city of 10,491 population. Now that the system has been installed long enough to judge its value, Chairman of the Fire Committee Mr. A. Cooper, states that the city has received 96 per cent of its alarms through the fire alarm boxes during a twelve months' period, and although definite statistics are not available, there has been a noticeable decrease in fire losses.

Examine the fire alarm records of your own city. If the percentage of box alarms is low, it is an indication that you have not a sufficient number of fire alarm boxes. Additional boxes should be installed until you have "A Box A Block" distribution, then as your city grows, a definite number of new boxes should be installed each year to maintain an adequate box distribution. Without that, you cannot maintain a high percentage of box alarms—the safe alarms.

The fire alarm box offers you the quickest and most reliable means of transmitting an alarm of fire.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

Traffic—Fire—Safety Items

of Interest to Departments of Public Safety

Specialized Training for Firemen—Aid Available from Federal Funds

THE great improvements which have been effected in fire-fighting methods are set forth in a bulletin recently published by the Federal Board for Vocational Education, entitled "Fire Fighting —An Analysis of the Fireman's Job, with Suggestions as to the Organization and Operation of Training." (See notice on page 115.) The establishment of the training programs advocated in this bulletin will, it is expected, materially reduce the daily money loss of $1,500,000, and the daily loss of 30 lives, caused by fires in the United States. It is imperative that firemen should be trained not only in the actual operations of handling fire hose and ladders, and other apparatus and equipment necessary in fighting fire effectively and efficiently, but also in what may be termed the technical aspects of the job.

Wherever classes for firemen are organized through a state plan, the application of Federal funds for the salaries of teachers can be approved. This should be in connection with the evening school, with perhaps a limited development of part-time classes to fit the special conditions; for example, in a series of communities where the state would hire one or more instructors to conduct training courses, perhaps one day each week in each of five or six towns, and where the instructor's time could be most effectively used during the day, for firemen regularly employed on the day shift. The use of Federal funds for supervision and teacher training, when conducted in harmony with the state plan, is likewise legitimate.

Full details may be obtained from the Federal Board for Vocational Education, Washington, D. C. The bulletin (No. 155; Trade and Industrial Series, No. 44) is for sale by the Superintendent of Documents, Washington, D. C., for 30 cents.

Institute for Chiefs of Police, New York State

IT has been realized that in addition to the police training schools which have been held annually for four years for the policemen of New York State municipalities a higher grade of instruction should be provided for chiefs of police. For this purpose, an Institute for Chiefs of Police has been held in Troy, N. Y., under the joint auspices of the New York State Association of Police Chiefs and the New York State Conference of Mayors. The Institute provided a three-day course of instruction in the administrative duties of police chiefs.

The organization and administration of a police department were discussed by William P. Rutledge, former Police Commissioner of Detroit, and the qualifications of a police executive, by Albert O. Allgeyer, Secretary of the Buffalo Civil Service Commission. A talk on police records was given by Donald C. Stone, Research Director of the International City Managers' Association. The importance of traffic regulation was discussed by Clarence Taylor, State Traffic Engineer for Massachusetts; criminal psychology, by Dr. A. W. Stearns, Commissioner of Corrections of Massachusetts; and crime prevention, by J. B. Blandford, Director of Public Safety of Cincinnati, Ohio.

There were registered at the Institute 124 chiefs or deputy chiefs of police representing 97 New York State municipalities and other organizations.

Sight-Obstructing Signs Removed from Maryland Highways

ACTING to enforce the law which went into effect in June and for the furtherance of traffic safety, the State Roads Commission of Maryland has recently removed a total of 21,250 illegal and obsolete signs from the highways of that state.

"More than 7,000 signs remain," according to H. D. Willar, Jr., Chief Engineer of the Commission, "but these are licensed signs. Under the terms of the new anti-billboard law, each of them must bear a permit. About 4,000 permits have been issued to persons or concerns advertising their own products, and over 3,000 to persons or concerns engaged in the advertising business. The revenue from the permits and licenses will be used for roadside beautification."

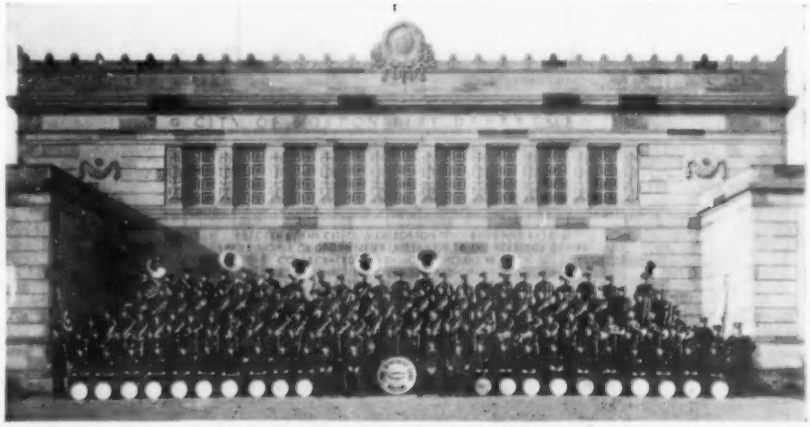
Building Codes Deficient in Daylight Provisions

"DAYLIGHT is an absolute essential to the health and safety of users of buildings and structures, and daylight of proper quality and quantity not only promotes and safeguards public health and safety, but also maintains and enhances property values."

"Practically all building codes are deficient in the matter of proper natural lighting."

These statements were made by George W. Thomas, of the H. H. Robertson Co., of Pittsburgh, at the Silver Anniversary Convention of the Illuminating Engineering Society in New York on October 16. Mr. Thomas has recently completed a study of nearly 100 building codes, with special reference to their provisions in these respects: adequate light; avoidance of glare; avoidance of heavy shadows; avoidance of silhouette conditions; adequate strength and safe accessories for the equipment; and provision for cleaning equipment and cleaning schedules. No one code went to the extent of even referring to all of the above-named points, he said.

"To sum up the situation of natural lighting in existing city building codes," Mr. Thomas declared, "is to say that natural lighting has had no consideration from the standpoint of light for light's sake; and that the purposes of natural lighting equipment have been hopelessly confused with ventilation, fire escapes and fire hazards and everything else rather than the *preservation of health, safety and property protection* as these might be and are affected by light."



THE BOSTON FIRE DEPARTMENT BAND
The organization of this group of 140 musicians has been due to the initiative of Fire Commissioner Edward F. McLaughlin, who has had the approval and support of Mayor James M. Curley

Quincy, Mass., adopts Teletype to speed up its still alarms

Teletype of Fire Dept. Begins Operation Today

Chief Sands Sends First Message Over System That Is Only One of Kind Installed in Any New England Department

This morning, at 9 o'clock, Chief William A. Sands of the Quincy Fire Department sent the first message over the newly-installed Teletype system connecting all fire houses in part the Teletype is going to play is in calls for the pulmotor or for equipment to extricate an injured man. Or, if a street is closed, a hydrant out of order or a thousand and one

WHEN on August 10th the Quincy, Mass., fire department began to use Teletype to transmit still alarms to its various stations, the event was described by the Evening Patriot Ledger of that city as follows:

"This morning, at 9 o'clock, Chief William A. Sands of the Quincy Fire Department sent the first message over the newly-installed Teletype system connecting all fire houses in the city with Central Headquarters. The apparatus is located in a small brick building at the rear of headquarters, where there are batteries and other electrical equipment hooked up in a manner to provide against any possibility of the system going out of commission unless the building is destroyed by a hurricane.

"In the operating room is a telephone switchboard, over which more than half of the city's fire alarms are received. A light glows, a man on the board says 'Fire Department,' notes the number and street where the fire is reported, swings partly around, presses a small lever which rings a signal bell in every station in the city, and then pounds the keys of what looks like a typewriter.

"He may write 'RUBBISH FIRE, CORNER FENNO AND BOULEVARD. ENGINE 4 AND LADDER GOING FROM BEALE STREET STATION.' This message is immediately typed on a narrow paper tape feeding out of the machine in each station. The man watching the tape shouts the message and they are away, even before the operator at headquarters can swing back to the switchboard.

"By the Teletype system the news of a fire and its location is known instantly in every section of the city. Likewise, if Chief Sands wishes to switch the apparatus around for better protection during a fire, he can call the operator and it is handled with one message over the Teletype.

"Another part the Teletype is going to play is in calls for the pulmotor or for equipment to extricate an injured man. Or, if a street is closed, a hydrant out of order or a thousand and one things that might interfere with the passing of a truck to a fire, the printing machine will tell all about it. Every message is printed in large, clear capital letters and can be filed for future reference if desired.

"There are six Teletype machines for receiving messages, and others can be added as more fire houses are needed. Chief Sands is convinced that the installation will pay for itself in the time saved in answering alarms."

As its name implies, Teletype transmits typewriting by wire at a speed of 370 characters a minute. Installations can be arranged so that an alarm can be flashed to any one station, to any group of stations, or simultaneously to all stations.

Why not give your own community the greater protection afforded by this machine that typewrites by wire? For further information consult your local telephone company or write the Teletype Corporation, 1400 Wrightwood Ave., Chicago.

TELETYPE
SUBSIDIARY OF
Western Electric Company
INCORPORATED

WALLACE T. JAMES
Fire Chief
Hamilton, Ont.
(Appointed 1923)

DANIEL H. SHIRE
Fire Chief
Mason City, Iowa
(Appointed 1927)

THOMAS R. MALONE
Police Chief
Wausau, Wis.
(Appointed 1991)

GEORGE SINCLAIR
Fire Chief
Toronto, Ont.
(Appointed 1930)

F. J. MILLARD
Police Chief
Bronson, Mich.
(Appointed, 1925)

Who's Who in Public Safety

The 45th of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

A. J. KAVANAUGH
Police Chief
Rochester, N. Y.
(Appointed 1927)

J. W. FISHER
Fire Chief
Covington, Ky.
(Appointed 1930)

JAMES A. SCHOOLEY
Fire Chief
Medina, N. Y.
(Appointed 1920)

SAMUEL F. HASSLER
Director of Public Safety
Harisburg, Pa.
(Appointed 1918)

C. E. GILLEN
Fire Chief
Racine, Wis.
(Appointed 1923)

J. J. BROWN
Fire Chief
Muscatine, Iowa
(Appointed 1915)

JAMES P. WELSH
Fire Chief
Eau Claire, Wis.
(Appointed 1906)

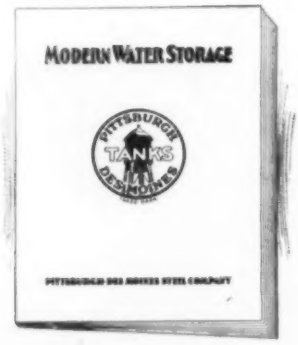
H. J. CALLAHAN
Fire Chief
Ft. Dodge, Iowa
(Appointed 1925)

FRANK F. ZIELSDORF
Fire Chief
Wausau, Wis.
(Appointed 1909)

PITTSBURGH DES MOINES

Modern Filtration Plant completed in July, 1931, for the City of Findlay, Ohio. The Consulting Engineers were H. P. Jones and Company, Toledo, Ohio

Two "Pittsburgh-Des Moines" Tanks Elevate the Water at Findlay's Filtration Plant



Write for New Catalog—Today!

"Modern Water Storage" our new catalog, has just come from the press. It contains 28 pages of reliable information, interesting photographs, authentic engineering data, and "Pittsburgh-Des Moines" specifications on various types of elevated tanks, penstocks, pipe lines, standpipes, steel reservoirs, treating plants, and complete water systems.

Interested municipal and industrial executives may obtain a copy by addressing our nearest office.

The smaller tank at the left holds 40,000 gallons and stands 48 feet to the top; the larger tank holds 500,000 gallons and stands 150 feet to the top.

These two "Pittsburgh-Des Moines" units assure in the water mains of Findlay an ample supply at improved pressures—even during periods of peak demand. They also permit a simplified pumping schedule, and guarantee steady, adequate service during interruptions in pumping for repairs or replacement work. The increased pressure guarantees plenty of water to outlying districts and to the newly built-up sections of the city.

PITTSBURGH TANKS DES MOINES TRADE MARK

Pittsburgh-Des Moines Steel Company

3412 Neville Island, Pittsburgh, Pa.
913 Tuttle Street, Des Moines, Ia.
Room 915—270 Broadway, New York, N. Y.

Chicago Atlanta Dallas San Francisco Seattle

NOVEMBER, 1931

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The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Removing Conflagration Breeders—A Worthwhile Job for the Unemployed

By FRANKLIN H. WENTWORTH

THE fire surveys of cities of medium size which are being made in increasing numbers by the field engineers of the National Fire Protection Association invariably reveal conflagration hazards that are perfectly obvious to everybody, and which flagrantly offend the esthetic sense as well as menace the common safety. I refer to old, dilapidated buildings, abandoned to the casual tramp, with windows usually shattered by the small boy. These conflagration breeders are sometimes owned by resident citizens, sometimes by non-residents, and are sometimes the property of estates whose trustees do not have to look at them. Our absurd and inequitable methods of taxation perpetuate eyesores like these. The fire departments are principally supported by heavy taxes on our best buildings which do not, or are not likely to, need firemen, instead of being concentrated on the old fire-traps which keep the fire department running the streets and impose an insurance tax on every other building in the community!

It has long been recognized that buildings that have become unsafe and in danger of collapse may be ordered razed by city building authorities as a protection to public safety, but the proposition that the old frame building offering a serious fire menace to the community should and could be condemned and removed has been slower to gain acceptance.

One of Two Things Must Be Done

There are but two things to do to a building which menaces a city or a neighborhood—protect it so that it cannot start a conflagration, or tear it down. If it is valuable or useful enough to retain, it can be rendered practically harmless to its neighbors by installing automatic sprinklers; if it is not valuable enough for this, its continued presence as a menace to the fire safety of other and better buildings cannot be defended.

With the growth in recent years of fire prevention bureaus in fire departments, which inspect the city for fire hazards, interest in the problem of removing the hazardous old building has increased. Power to order removal of such buildings may be vested in the city building department or in the fire prevention bureau, preferably the latter. A satisfactory method of defining this power appears in a section of the model ordinance establishing a bureau of fire prevention adopted by the National Fire Prevention Association, which is quoted below:

"The chief of the fire department or inspectors of the bureau of fire prevention, upon the complaint of any person, or whenever he or they shall deem it necessary, shall inspect all buildings and premises within their jurisdiction. Whenever any of said officers shall find any building or other structure which, for want of repairs, lack of or insufficient fire escapes, automatic or other fire-alarm apparatus or fire-extinguishing equipment, or by reason of age or dilapidated condition, or from any other cause, is especially liable to fire, and which is so situated as to endanger other property or the occupants thereof, and whenever such officer shall find in any building combustible or explosive matter or flammable conditions dangerous to the safety of such building or the occupants thereof, he or they shall order such dangerous conditions or materials to be removed or remedied, and such order shall forthwith be complied with by the owner or occupant of such premises or building."

Ridding Portland of Dilapidated Buildings

One of the most successful campaigns to rid a city of dilapidated buildings is being carried on by the Fire Marshal of Portland, Ore. It is a method which exhibits unusual tenderness toward the landlords of such properties, who should assume proper responsibility for the buildings they own, and if the buildings are a menace to the community, should see that they are attended to. However, where a city official is willing to assume the responsibility and take the initiative, there should be no objection to it. In Portland the Marshal secures the permission of the custodian of the property to have the building removed without expense or liability to the owner. He then gets a wrecker to agree to remove the building, securing the proper permit from the Building Department and doing the work to the satisfaction of the

AMONG ONE FIRE PREVENTION BUREAU'S "FINDS"

Many citizens were astonished that the picture above showed conditions in their own community. How about *your* city's unsuspected conflagration breeders?

A SPOT NOW CLEARED

The huge, ramshackle structure illustrated at the left extended through an entire block. It was condemned by the fire prevention authorities, and demolition work was almost immediately begun

Fire Marshal. By this plan the owner is not forced to pay anything for the removal of the building, and the wrecker accepts material and salvage as his compensation. In the first fourteen months of operation of this system, 820 buildings were condemned and 790 were wrecked. Almost equally effective campaigns have been carried on through the old method of impelling action by the owners through law or persuasion in the cities of Providence, R. I., Brockton, Mass., Springfield, Mass., Youngstown, Ohio, Minneapolis, Minn., and Indianapolis, Ind.

At the present time when many cities are looking for worthwhile work for the unemployed, the demolition of old and useless structures is an activity especially worthy of attention.

Water-Works Improvements at Minimum Tax Cost

REALIZING the conflict between the urgent calls upon all cities for the relief of unemployment and the harassed and insecure position of the taxpayer, the New England Water Works Association at its annual convention in October adopted a resolution urging that funds to be expended in unemployment relief be applied to the provision of needed water works and other revenue-producing public works. It was pointed out that a small initial expenditure, sufficient to pay interest on construction funds, should encourage the undertaking of a vastly greater total expenditure that would be of self-supporting character in a short time.

Taking as an example the state of New York, where $20,000,000 was recently authorized by the state government to be raised from the state income tax for unemployment relief, the text of the resolution suggests the following program of action:

"Instead of raising $20,000,000, as authorized, through taxes on incomes in one year, raise $7,000,000 per year, for three successive years, amounting to 70 cents per urban capita.

"Notify all communities having populations of 1,000 and more that 70 cents per capita will be paid to them from the unemployment relief fund to be used to pay interest on bonds for improvements to revenue-producing properties, for a period of three years. After this the community will assume its own interest payments and presumably at the end of the first five years will also assume its own amortization of bonds issued.

"Seventy cents per capita is the interest at 4½ per cent on $15.50 per capita. This means that the interest for three years will be guaranteed to urban communities in the state on a total of $155,000,000 worth of construction work applied to revenue-producing properties. It is estimated that more than half of the proceeds from such bond issues would be paid to local labor in the communities, and the balance would provide employment in cement mills, foundries, gravel pits, etc.

"The above figures are based on average performance by all urban communities. Undoubtedly there will be some communities which have already made all needed improvements to their revenue-producing properties, and others which are in immediate need of improvements considerably in excess of the average. Payments from the fund should be made annually up to a maximum of 70 cents per capita for all new revenue-producing works initiated within the next sixty days. Such money as remains in the fund due to works below the average in cost should then be distributed among those communities which initiate work in excess of the average and in proportion to the amount of work in such excess. . . .

"None of the expenditures would add to the present burden on real estate. All capital charges for permanent improvements to the utilities would be borne after three years by those using them through rates paid for the service taken.

"Under present conditions the main obstacle to raising money for water-works improvements is the difficulty of paying the interest on their cost during the first few years while the business is growing to a paying use of the new facilities. This difficulty would be largely removed if interest were paid during these years. The fact that the community ultimately would assume the interest charges and amortization would serve as a check on extravagant improvements which are not really justified by the need for them."

How Advance Planning and Budgeting Have Benefited St. Paul

By GERHARD BUNDLIE
Mayor, St. Paul, Minn.

IN the August issue of THE AMERICAN CITY there is reference to inquiries sent out by the editors of *City Planning* to some fifty resident planning engineers in cities of different population groups. These inquiries, it appears, were directed to the central question as to whether city plans expedite public improvements during a period of depression.

City planning consists essentially in making those physical improvements which are of greatest social and economic value to the city in the order of their urgency and under a budgeted program. Some municipalities have failed to adopt master plans, others have contented themselves with merely adopting such plans and have failed to translate them into realities through the agency of sound financing programs. The matter of financing is just as important as the plan.

A Permanent Program of Improvements

It may be of interest to cite St. Paul's experience as a case in point. In 1922 there was prepared a "Plan of St. Paul." It was not until 1926, however, that steps were taken to budget over a period of years a comprehensive coordinated permanent improvement program. In 1927 the United Improvement Council, made up of public officials and representatives of various civic, labor and service clubs and associations, was organized. This organization was, in fact, a cross-section of St. Paul's citizenry.

Using the 1922 plan as a basis, the United Improvement Council formulated a permanent improvement program, incorporating therein not only the specific projects themselves, but also a sound plan for financing them. The program—one designed to be completed over a period of five years at a cost of approximately $15,000,000—was submitted to the electorate and approved by an overwhelming majority in November, 1928.

We are now in the midst of that program, which, among other things, includes many street-widening and building-construction projects and the further development of our parks and parkways. Not only is the plan itself a sound one, but it is being so financed as to but lightly burden the taxpayer. The program has taken care in great measure of the problem of unemployment and has rendered it unnecessary to resort to hastily prepared and ill-conceived methods of furnishing work to those who need it. The beautiful thing about it all is that those employed in the actual work of carrying forward and completing our program are engaged in *permanently improving* our city in accordance with a well-considered plan.

How a City May Be Prepared to Meet Depression

It is obvious that if a city has a master plan, public improvements can and will be expedited in times of depression and the work done thereunder will be of genuine value. In the absence of such a plan, a municipality in times of depression, and when confronted with an emergency, is apt to expend such public moneys as may be available, with the thought, first, of furnishing employment and with little or no thought given to the results to be realized from the expenditures made. Funds so spent may be largely wasted.

The common-sense thing for a municipality to do is to have formulated and to adopt a carefully considered plan and by long-term and wise budgeting provide for the

THE NEW SKYLINE
At the left in the background is the State Capitol Building. In the right foreground is Harriet Island, a 39-acre downtown athletic field and playgrounds

SOUTH ROBERT STREET GRADE REDUCTION

This grade was reduced from 10½ per cent to 6½ per cent. The route has been designated by the State Legislature as Capitol Highway, as it starts at the State Capitol grounds and runs directly south to the state of Iowa. The grade reduction was made to save a circuitous route

THE THIRD STREET ESPLANADE, ST. PAUL

This is one of the projects being carried out by the city. The double driveway has been completed, and the area on the right covered with parked cars is now being raised to the level of Third Street and will be a formal park. Third Street passes under the Union Depot concourse with two 27-foot driveways and then onto the viaduct which can be seen over the roof of the concourse. The driveways in the foreground are 38 feet wide. The new City and County Building is now being erected on the site shown. The new Post Office and Customs House will be erected just to the right of the concourse, where buildings are being torn down, as shown in the picture

completion of the projects included therein over a period of years. The expenditure of funds under such a program constitutes a sound investment, since the city's assets are increased and its development promoted.

Through the medium of our program, the activities and the energies of our people generally have been stimulated. Private enterprise has been greatly encouraged. Many private business concerns are erecting structures; many have just completed the construction of buildings designed to serve adequately their present and future needs. St. Paul's skyline is changing materially, and a sense of well-being is evident. Several visitors to our city, who have observed conditions as they exist in various sections of the nation, have told me that conditions in St. Paul are more nearly normal than in any other large center of population in the country.

Our experience demonstrates that the city, no less than the individual, should "plan its work, then work its plan."

EDITORIAL NOTE.—In THE AMERICAN CITY, January, 1931, pages 109-110, there was an article on the Third Street improvement above illustrated. See also the issue of May, 1931, page 144.

Berkeley, Calif., Films Her Municipal Life

THE city of Berkeley, Calif., has recently had its various municipal activities and personalities portrayed on a five-reel 16-mm. (home movie size) film, made by Harold L. Hock, City Assessor and a member of the Amateur Cinema League.

The picture is entitled "Barbara Learns About Berkeley," Barbara being the bride of a young college instructor whose specialty is municipal government, and who conducts her on a tour of the city offices and undertakings and shows various municipal departments in action, thus giving his bride—and the audience—a realistic idea of what the city government does, and who does it.

The office of City Manager Hollis R. Thompson is first visited, where Mayor Thomas E. Caldecott and the members of the City Council are met; Mr. Thompson then escorts the pair to Police Headquarters, where a large group of Junior Traffic Police are gathered, some of these being shown in action; the functioning of the police signal system is then demonstrated in the summoning of an officer to pursue two bandits fresh from a hold-up. These are captured by means of a police automobile after a dash through the streets. The police records bureau is also shown, followed by Health Department scenes, including a baby clinic, rat catching, the testing of diphtheria cultures, and diphtheria immunization. The Children's House and a day nursery with its playground are also seen.

The Recreation Department comes in for considerable attention, with views that include Superintendent Charles W. Davis in his office, several playgrounds, ball fields, tennis courts and summer camps with swimming and boating, and a number of city parks. After these the Corporation Yard is shown, with automobile repairs going on, paving and sewer material ready for use, and a fleet of garbage trucks. Filling and reclaiming operations in connection with waste disposal are pictured. City Engineer and Street Superintendent Harry Goodridge is introduced, and his ready-reference collection of maps is shown. The Fire Department is then featured, together with warning pictures showing results of shingle fires and grass fires, and the operation of cutting a wide fire break in the woods bordering the city.

The remainder of the film includes many other city offices and their incumbents.

Odor Control in Small-Town Disposal Plant

By **H. G. OLMSTED**
Consulting Engineer,
El Paso, Texas

THE IMHOFF TANK
In the left foreground, the crank for breaking up the scum

THE city of Farmington, N. Mex., with a population of 2,200, is situated in the northwest corner of the state. It is at the confluence of the San Juan, Animas and La Plata Rivers, and is a typical agricultural city, as the three rivers afford plenty of water for irrigation purposes throughout the valleys. Although oil and gas fields have been developed to a small extent, present adverse conditions have caused this development to be much retarded.

In planning the sewerage system, consideration was given to the possibilities of a rather extensive development of the oil and gas fields. In January, 1931, the city adopted a comprehensive plan for sewerage which included the entire city, or approximately 2.5 square miles. However, only 4.5 miles of lines were installed this year, serving that portion of the city which is already built up. The topography of the city is such that we were able to construct a gravity system. In locating the various lines, the minimum gradients considered were as follows: 6-inch pipe, 0.6 per cent; 8-inch pipe, 0.4 per cent; 10-inch pipe, 0.29 per cent. The city uses ditch water from one of the irrigation districts for all yard and garden sprinkling. On the mesa, in the northeast part of the city, we found ground water close to the surface. This is due to irrigation ditches and seepage from the La Plata River. The longest individual line in the city, outside of the main outfall, extends into this section and is 6,340 feet in length. In four places on the mesa the sewer pipe was laid with open joints entirely covered with coarse gravel for a space about 6 feet in diameter. This provides for a constant flow of water, in this long line, of 20,000 gallons per day.

The city obtains its water from an irrigation ditch and has a very minor treating plant consisting of a settling tank and chlorination. As a result of lack of proper treatment, the water is very high in sulphides.

Type of Sewage Treatment Plant

In determining the type of sewage treatment plant, the original cost and the cost of operation were the governing points. The taxable valuation of the city is such that excessive cost of construction or operation would preclude any installation. After considerable study, it was decided to install an Imhoff tank, sprinkling filters and a sludge drying bed. The plant is located on a side hill parallel to a main highway leading out into the Navajo Indian Reservation. The plant is also within 1,500 feet of the City Hospital, hence the control of odors is most important. The treatment plant has several features unusual in small-town plants.

The Imhoff tank is 20 feet by 20 feet with a depth of 23 feet. Over the scum and gas chambers is built a concrete cover with three manholes in the

THE BACK OF THE PLANT
This view shows the covered sprinkling filter and, in the foreground, the chlorinating house

top over each chamber, to furnish access to the inside of the tank. These cast iron manhole covers are airtight, painted with asphalt and sealed with a heavy coat of asphalt at the rim.

There is a scum trough on each side, so that the scum can be drawn off from time to time. This trough leads through the tank to a flume outside, and thence to the sludge drying beds. A crank located on the side of the tank and connected to a shaft running the full length of the tank is used to stir the scum and prevent its packing, and permits the escape of gases. This shaft carries paddles similar to the propeller of an outboard motor. The attendant turns the crank a few times daily, this being sufficient to break up the scum. The shaft is made of one-inch galvanized pipe filled with sand, with bearings at either end fitted into the concrete walls. The bearings are the rear-wheel hubs of an old Model T Ford, and the shaft turns on the roller bearings of the wheel. The center support is a babbitt-bearing fitted snug. The end bearings are packed in grease, with the grease held in place by felt washers backed with cast iron washers.

The cover over the scum chambers rises to the center, forming a dome. In the top of this dome is a 4-inch cast iron pipe thoroughly coated with an asphalt paint which carries the gas to a small circular storage tank controlled by two gate valves, one in the line and one just beyond the reservoir. The storage tank consists of a concrete shell with a galvanized iron tank inside, equipped with rollers on the sides to enable it to rise and fall, depending upon the amount of gas stored in the tank. By keeping 2½ feet of water in the tank, a gas-tight seal is maintained. The gas is piped from the storage tank to a gas burner located in a vented concrete house adjacent to the sprinkling filters. It is planned to install a hot water system when the plant has been in operation several years, piping hot water into the sludge digestion chamber of the Imhoff tank for winter service. The sewage gas will be used as fuel for heating the water.

The remainder of the plant consists of a dosing tank, sprinkling filters, sludge drying beds and a chlorinator. A roof was built over the sprinkling filters to help control odors. A dormer window in the roof provides access to the filter beds.

Chlorination

The three-story disinfecting plant consists of an upper tank where commercial chloride of lime is dissolved in water and is then piped to the middle tank, where the mixture is properly diluted, and thence to the bottom tank, where it is mixed with the effluent from the sprinkling filters. A rather unusual condition was encountered. As stated before, the city uses irrigation water for yards and gardens, with the result that the seepage throughout the city is very heavy. The seepage flows to the southwest part of the city, where the plant is located. Under a large tree at the treatment plant is a spring which flows constantly at the rate of about 200,000 gallons per day. The spring has been utilized by running a 2-inch pipe from it to the upper story or mixing chamber of the disinfecting plant, and a 4-inch line is connected into the line from the sprinkling filters. Chloride of lime solution is mixed with the effluent by a series of baffle plates located in the bottom chamber. The effluent then passes through a pipe line under the highway to an open ditch, thence to the San Juan River.

The sludge drying bed is to the left of the hypochlorite plant. It is proposed to cover this bed at a later date. The work of construction has just been completed.

The system was designed by the writer, and the operation of the plant will be under his supervision. The Orman Construction Co., of Pueblo, Colo., was the general contractor, and the disposal plant was built by Marsh, Pierce and Marsh, of Farmington.

Financing

This work was all handled under the sewage district plan. The entire cost of the system was paid under the front-footage assessment against all property abutting on the various lines and mains. The cost per front foot or abutting foot was $1, with sewer bonds issued against the district running serially for a period of ten years. The total cost of the system was $10,000 for the disposal plant and $25,000 for the sewers.

Architects and Landscape Architects Urged as Cemetery Board Members

"THERE is nothing that needs proper supervision and planning more than the modern cemetery, for there is certainly nothing that suffers more from vulgarity, ignorance, and pretentiousness on the one side, and grasping unscrupulousness on the other.

This utterance of St. Gaudens was recently quoted by Horace W. Peaslee, of Washington, Vice-President of the American Institute of Architects, in a discussion of the "interesting though depressing" status of present-day cemetery planning.

"Although in our homes, in our places of business, in our public and semi-public buildings we call for the best talent of architect and sculptor, although in our cities we may have planning commissions and organized effort in general planning, when it comes to the field of the dead," Mr. Peaslee declared, "in an unbelievably large proportion of cemeteries we entrust their design and arrangement to laymen, their maintenance to gardeners, and their monuments to commercial firms of stone cutters."

Fort Lincoln Cemetery, contiguous to the District of Columbia, was pointed out as having been developed in harmony with the tenets of St. Gaudens. Here "the first effort was to tie the cemetery into the park system. A mile of river frontage and a panorama hill were offered by the directors of the cemetery as integral elements of the park system. The project was designed in its entirety along broad lines, and effort has been made to preserve and enhance existing elements of tranquility and natural beauty, and to prevent the ill-considered transformation of God's acre into a charnel house of crowded tombstones.

"A great bulk of stone has been eliminated by the preservation of interior areas of sections as open lawn spaces, with all individual graves located by markers flush with the turf, with family monuments permitted only along driveways; these to be softened with belts of planting and every one of these monuments subject to approval, in form and in detail, only upon the advance submission of a carefully made scale drawing."

Mr. Peaslee urges that representative architects and landscape architects should be placed on the cemetery board of every community in the country in order to accomplish needed technical supervision.

THE APPROACH TO THE PLANT

The building where the cans are washed is seen at the left, and in the foreground one of the collection wagons, which carries 100 containers

Garbage Collection and Disposal in Steubenville, Ohio

By **E. S. FARMER**
Superintendent, Refuse Disposal Department

THE city of Steubenville, with a population of approximately 40,000, is located on the Ohio River between Pittsburgh, Pa., and Wheeling, W. Va. Two years ago a system of free garbage collection and disposal was inaugurated, at which time ¼-mill was added to the tax duplicate to finance the new service. Garbage only is incinerated at the two plants, one 70-ton Pittsburgh-Des Moines furnace and one 60-ton New York Walthers unit located together at the river bank. All other refuse such as ashes, tin cans and bottles and all ordinary combustible rubbish is hauled to a large ravine beyond the city, by licensed rubbish haulers under the control of the City Health Department. The dumping grounds are under the supervision of the Service Department.

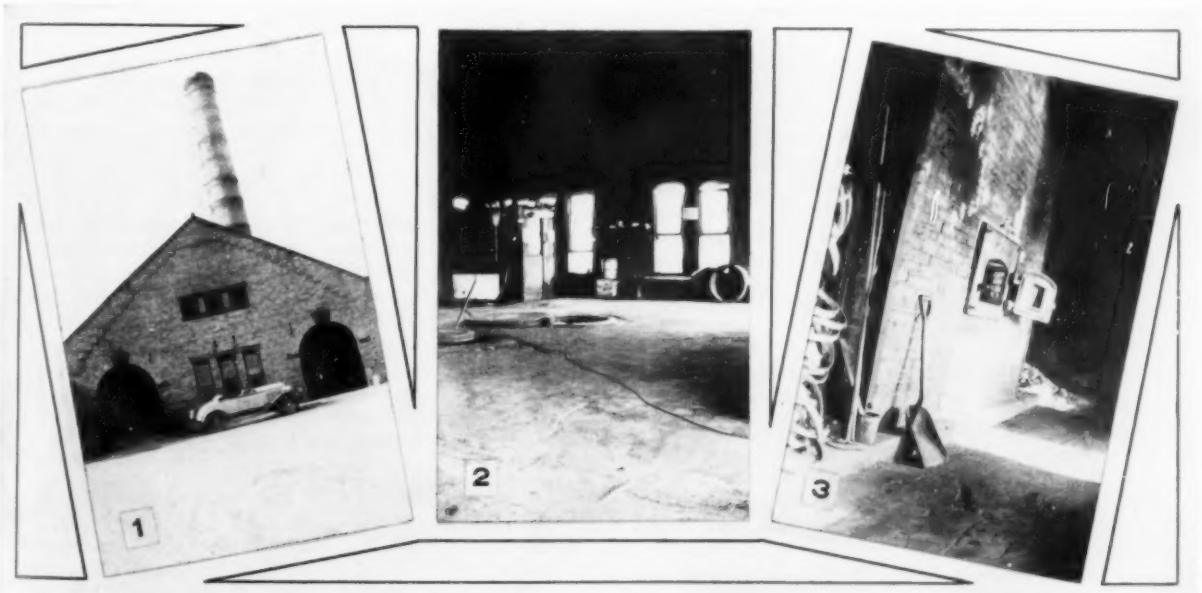
Municipally Owned Garbage Containers

The city has in stock about 12,000 tightly covered galvanized containers of approximately 60 pounds capacity. About half of these are in service while a like number are in transit, being emptied, washed, and made ready for use again. The city furnishes these containers to all garbage producers at a yearly rental of $1 per can, and requires, by city ordinance, that all garbage be drained and tightly wrapped in paper before being placed in the containers. Collections are made once a week in the residential sections and as often as necessary in the business districts. A clean container is left by the collector to replace each full one removed, and all garbage of 60 per cent or more liquid waste is refused.

Collection and hauling of garbage is done by contract at the cost of 6 cents per container to the city. The contractor furnishes all labor and transportation equipment, which at present consists of five two-horse-drawn wagons, one 3½-ton truck and one 1½-ton truck, the latter being used as an emergency truck.

Disposal by Incineration

The disposal plant is operated by a force of ten men and a superintendent at an average wage of $4 for an



THE PITTSBURGH-DES MOINES INCINERATOR AT STEUBENVILLE

1. Entrance to the charging room of the incinerator. The Superintendent's car in the foreground. 2. Interior, showing the charging floor and openings through which the garbage is dumped. The clerk's office is in the background. 3. Firing room on the ground floor

eight-hour day, beginning each turn at 12 o'clock midnight excepting Sunday. One man works during the day to clean, repair and refuel the furnaces for the next day's work. Coal is used for fuel, supplemented by all the old wood that can be picked up, which is also needed for starting the furnace fires.

For the year ending June 30, 1931, a total of 11,764 tons of garbage was collected and disposed of, using 423 tons of coal. During this period, 1,580 animals were cremated, including horses, cattle, sheep, hogs, dogs and cats. A fee of from 25 cents to $2 is charged for this service. The income from these fees, with a small amount of garbage sold at 2 cents per can for stock feed, netted the city approximately $650.

Prospective Improvement

Those responsible for the operation of this sanitary service feel that municipal collection with the latest type of trucks and trailers would be more sanitary and economical than the present contract system. Before the installation of any new system of collection, consideration must be given to the topographies of the communities. Horses and wagons can be driven through narrow streets and alleys more easily than can large trucks. Offsetting this, however, is the damage from wagon wheels and horseshoes on different types of pavements, and the traffic menace of horse-drawn vehicles in the business district.

The chief difficulty experienced in the collection service is to educate the foreign element of a city in the requirements of ordinances, particularly with regard to the placing of garbage *only* in the containers and keeping the containers sanitary and closely covered. Another difficulty encountered is the lack of direct control over the contractor's employees.

It is believed that Steubenville has a fairly good collection and disposal system, and those in charge are constantly seeking improvements in their endeavor to give the city a more sanitary, clean, efficient and economical service. Caring for the waste material which every home must discard is the one service which every city looks upon as the most difficult to handle in a manner satisfactory to its citizens and taxpayers.

A 25-Year State Recreation Plan for Iowa

That All Citizens May Enjoy Iowa's Natural Resources

THE state of Iowa under the leadership of its Governor, Dan Turner, by authorization of its progressive Legislature and through the agency of its Fish and Game Commission and Board of Conservation, has begun an historic undertaking. Briefly, the state proposes to make it possible for every citizen to use fully Iowa's natural resources for outdoor recreation and to conserve and develop those resources for that purpose.

There are many phases of the project. Just when Iowa's fine highway system is nearing completion and Iowans can and do drive about their state more fully than is possible in many sections, this program is started to provide beautiful, interesting places to visit within easy driving distance. Picnicking, which is now the great outdoor family sport in Iowa, is to be given a first place in the selection and improvement of beautiful spots. Swimming and boating are to be highly developed. Winter sports are part of the program.

Nearly every man and boy in Iowa wants to do some hunting or fishing, or both. With many fine streams and lakes polluted and game refuges destroyed, the hunting and fishing situation is now bad compared with what it might be. This project includes the problem of stream and lake cleansing (through the State Health Department) and the propagation, rescue and stocking of hundreds of millions of fish in scores of clean and cleansed lakes and rivers. It also includes the great increase of game birds throughout the state, and this requires considerable scientific study.

Planning for the Conservation of Beauty

The nature lover, whether he be scientist, "pure conservationist," fisherman or hunter (and they are all nature lovers), is to have his point of view emphasized. Natural beauties of the landscape are to be preserved, likewise natural wild life, both plant and animal. For example, planting along highways and the preservation of views from the highways are major elements in the program. Iowa is literally a vast garden. Everybody sees it nearly every day from the highways. At thousands of points the views are fine, ranging from the broad, rolling uplands to the semi-wild deep river valleys, the northern lakes, the tumbled northeastern hills and the great cliffs of the Mississippi and Missouri Rivers. It is expected that zoning, easements, wide rights-of-way and roadside parks will all be used for getting and holding the views of valley and field and river and lake.

Historic sites, with particular reference to Indian archeology, and likewise points of unusual scientific interest, will be part of the specifications for the program. Reforestation, water power, and water supply are basic conservation problems involved in this project.

The whole thing is being worked out as one plan because every element touches every other one. For example, the enormous demand for better sportsman hunting and fishing cannot be met in Iowa unless it is dovetailed with the other conservation and recreation items. Hence, the two commissions above named are working as a unit on a survey of the whole situation and the preparation of a 25-year plan and program. They have engaged Jacob Crane, Chicago planning engineer, to direct and coordinate the technical work. Many agencies and individuals will take part: conservationist and sportsman organizations; the various state departments; the staff of the Fish and Game and the Conservation Commissions; the U. S. Biological Survey and the Bureau of Fisheries; the National Conference on State Parks; the State University and College; and the conservation people in other states.

The members of the Fish and Game Commission are Dr. W. C. Boone, Chairman, J. N. Darling, D. H. Goeders, A. E. Rapp and Dr. J. F. Walters. The Board of Conservation is composed of W. E. G. Saunders, Chairman, Mrs. Henry Frankel, Mrs. C. C. Laffer, Mrs. R. H. Volland, and J. G. Wyth. Mr. Ralph Kittinger, Secretary of the Iowa State Executive Council, also serves as Secretary of the Joint Committee of the two Commissions.

The Parkway as a Traffic Artery

Part II

By HERBERT S. SWAN
City Planner, New York

Parkway Design

The Westchester County parkways have merited wide attention and much favorable comment on account of their almost perfect adaptation to local requirements. They are notable among parkways for unobstructed traffic movement and charm of surroundings.

The Bronx River Parkway was the first of the Westchester County parkways. It is some 16 miles long and 200 to 1,200 feet wide. The final section was opened in 1925. The roadway is, in general, located in the center of the right-of-way. Grades were at first separated on only a few of the principal cross-streets, but the remaining grade crossings proved so obstructive to traffic that most of them have since been eliminated. The single roadway for two-way traffic gives way in sections with transverse grades to two one-way roadways. The roadway is generally curved, in places rather sharply, to fit the topography and to avoid considerable cuts and fills, but these cuts and fills are flattened out more or less into the surrounding area. In dredging the river, the low areas were filled, small dams were built to form occasional small lakes, and the river banks planted. The various recreational facilities supplied make the parkway no less a source of pleasure to the neighboring resident than to the motorist.

The Hutchinson River Parkway, 11 miles long, 200 to 1,000 feet wide, but generally about 500 feet wide, was opened in 1928. The roadway, usually located in the center, has a pavement 36 feet and 40 feet wide. The roadway has been graded, however, so that the pavement can be widened to 57 feet and 60 feet, when required. Improvements have been effected in the roadway as the result of experience obtained in the use of the Bronx River Parkway. The roadway is of practically uniform width, with curves less sharp than those on the Bronx River Parkway, the minimum radius being 560 feet. Grades are also less steep, the maximum being 6 per cent. All highway grade crossings on this parkway have been eliminated by artistic bridges. No continuous side roadways have been laid out on either side of the Westchester parkways. Street frontage for building development is not provided except in case of existing boundary roads or where access to buildings is required. Generally, the parkways are bounded by the rears of lots or tracts not yet subdivided.

In places it would be difficult, if not impracticable, to establish boundary roadways on account of existing street and building development; in any case, marginal roadways would have added considerably to the cost of the projects. Nevertheless, it may be asked whether service roadways along the parkways would not have been desirable for the development of the surrounding area.

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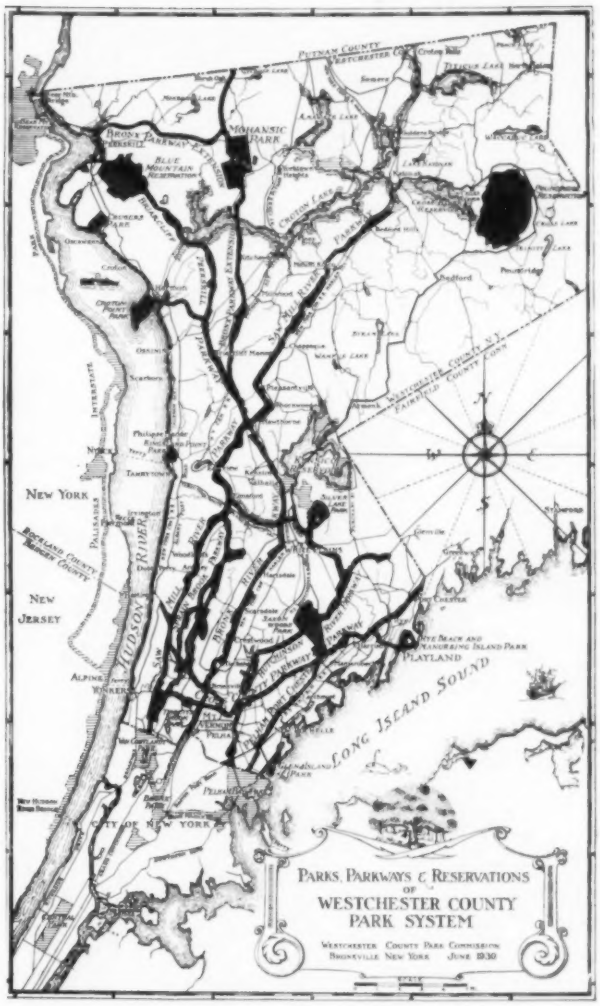


A PIONEER IN PARKWAY PLANNING

This system includes a total length of 160 miles, 44.3 miles of which has been completed. The Westchester County Park Commission has already demonstrated beyond doubt that a network of regional parkways may serve as the traffic arteries of a large community

An example of a narrower and more formal highway is Eastern Parkway in Brooklyn. Here a parking strip 35 feet wide with two rows of trees flanks the 60-foot-wide express roadway on either side. Two service roadways, each 25 feet, care for the local traffic. On each side, 15 feet is allotted to planting strips and sidewalks. Back of the property line are 30-foot front yards.

Much has been written about the superhighways of Detroit. Lest it be assumed that these so-called superhighways are parkways, let it be said that there is no resemblance whatever between these thoroughfares and a parkway. The Detroit superhighway is, in effect, nothing less than a right-of-way, 84 feet wide for a depressed rapid railway, flanked on either side by a 40-foot roadway and a strip 20 feet wide for sidewalks and planting strips.

A CENTRAL PARK STRIP

A local street for small-volume traffic may be divided into two roadways with the central park strip planted satisfactorily, as in the case of Occidental Boulevard, Los Angeles, above illustrated. This is not ordinarily a good plan for a main traffic artery

The superhighway of Detroit is never likely to become a desirable street for residence. It is very doubtful whether it will ever enjoy much popularity for business purposes, because of the open-cut railway in the center, which will make it difficult for pedestrians to shop on both sides of the street.

Center vs. Side Roadways

It is not our purpose here to enter into a detailed consideration of the relative merits of different parkway designs. That would lead us entirely too far afield. Yet, in passing, it may not be amiss to review some of the lessons taught by experience in connection with the development of parkways.

Many parkways in different parts of the country, particularly those in Westchester County, have demonstrated the desirability of acquiring the relatively cheap land along watercourses for parkways wherever they are needed for traffic routes. They have also shown that a marginal park on either side of the express trafficway is to be preferred to an interior park strip with boundary streets devoted to fast traffic.

Entrance of local or boundary streets into the parkway should only be at long intervals; cross-streets should be infrequent, and, so far as cost will permit, there should be a separation of grades with the main trafficway.

The express roadway should fit the existing topography as closely as gentle grades and easy curves will allow. The curvature and grades of the roadway should be adjusted so that the appearance of the roadway to the motorist is as undisturbing as the parkway views. The parkway when laid out should be a part of the comprehensive plan of the neighborhood and should be arranged to the advantage of the abutting property so far as it can be done without injury to the parkway. Local streets should be adjusted to it so as to make a satisfactory street plan. In general, the parkway should be bounded by continuous streets or service drives entirely distinct from the parkway and connected with it only at rather long intervals.

In a strictly formal parkway design, too, there is little doubt of the superiority of a center two-way roadway for fast traffic, flanked on either side with service roadways and generous park strips between the three roadways, as compared with a parkway design consisting of a center park strip flanked only with a one-way roadway on either side, serving both as a trafficway and as a local street. Side planting strips on either side of a fast trafficway have a great advantage in that the trees and plantings shield abutting owners from the dust and noise of the traffic. Fast traffic in a center roadway, moreover, obtains a much better view of cross-traffic approaching an intersecting street. Side roadways with no separation of fast and slow traffic lower the speed of all the fast parkway traffic; the view of traffic approaching intersections on the cross-streets being measurably less on the side roadways than on a center roadway, the speed of their traffic, in order to maintain the same degree of highway safety, must also be less. The inevitable business use of the abutting frontage on ordinary side roadways, with all its incident parking and deliveries, slows up the fast traffic still more. The traffic and pedestrians on the cross-streets are also endangered more by side roads for fast traffic. If, in addition to providing side parking strips, the width of the parkway is great enough to permit a planted strip in the center of the high-speed roadway, so much the better.

An objection raised to a strictly formal parkway is the frequency of intersecting cross-streets. Where there are, however, three roadways in a parkway, the planting strips between the center roadway and the two service roadways may be lengthened so as to extend the entire distance between successive major streets; then no local traffic can enter into or cross the fast trafficway except at the major cross-streets. Where this is done, traffic is able to proceed just as rapidly and satisfactorily on a strictly formal parkway laid down on a gridiron street plan as on an informal parkway like those in Westchester County. Of course, where a formal parkway contains only two roadways, with each roadway bordering directly upon the abutting frontage, each roadway will of necessity have to be crossed by all of the intersecting streets. Such a roadway design, in the very nature of the case, cannot provide for as fast a traffic speed as one with a center roadway and infrequent intersecting streets.

Planting Strips

Wherever central planting strips are used, they should be wide enough to support satisfactorily two rows of trees. It is doubtful whether a planting strip less than 40 feet

A CHICAGO BOULEVARD

One of the cases where "the design approaches a compromise of undesirable alternatives." The proximity of traffic to the abutting frontage almost invariably invites a business use. This slows down traffic. As in the South Parkway Boulevard, Chicago, it also results in ugly surroundings. Where the central planting strip is so narrow, it seldom proves satisfactory

wide meets these requirements. Where a park strip is designed for but one row of trees, it should generally be not less than 15 feet wide. A park strip as much wider as conditions will permit is of course desirable, but 15 feet, it is felt, is the irreducible minimum width for a row of trees. Parkways have been designed in various cities with tree spaces as narrow as four, six or eight feet in width. Such narrow strips will probably never prove satisfactory for trees. Experience shows that trees planted in such narrow strips must constantly be replaced. The result is that the parkway in proportion to the height of the trees is usually out of scale, and assumes an awkward and ungainly appearance. Wherever used, planting strips should be sufficiently wide to allow trees to attain a full and vigorous growth; if their width is inadequate for this, they should not be used at all.

The harmonious effect of a parkway demands the maintenance of a certain scale between the height of abutting buildings, the width of the parkway and the division of the parkway itself into roadways, planting strips and sidewalks. As a safety measure, trees in parking strips should not be placed so close to intersections as to interfere with a clear view of cross-traffic.

From the point of view of recreation, a central planting strip is not nearly so serviceable as a side planting strip. A central planting strip is relatively less accessible than a planting strip located between a center and a service roadway. Pedestrians being obliged to cross the roadway used by slow and fast traffic are less apt to use a park strip than if they need cross only a local service roadway. But the recreational value of these park strips should not be over-estimated. As a rule, all strips, whether central or side strips, are undesirable for recreational use, even as promenades. The recreational value that accrues from their use should be appraised from the pleasure and relaxation they afford the motorist rather than the pedestrian. The pedestrian should, so far as practicable, be discouraged from utilizing the parkway and induced to seek his recreation elsewhere.

Place of Parkways in the City Plan

If nothing is done to assure that the most heavily traveled through streets are permanently retained as express routes for the future, it will be only a question of time until all of our main traffic highways become clogged with slow traffic. It is therefore of the utmost importance to retain our arterial trafficways as through express streets for fast traffic between distant points.

To make such thoroughfares 80, 100 or 120 feet wide and leave them as ordinary streets, it is certain, will not accomplish this end. The streets will still be so narrow and their consequent design such that the adjoining property will have a business value. Yet, because of their extent, all the property on these streets cannot possibly be utilized for business purposes. The value of business property, like that of all other commodities, is controlled

FAIRMOUNT PARKWAY EXTENSION, PHILADELPHIA

However named, a street still remains a street. This Parkway, cut through solid buildings in the downtown section of Philadelphia, illustrates most emphatically that parkways should be incorporated as integral parts of the city plan, not only in order to be in themselves the most useful, but also to permit of the most economical development of the abutting frontage. Note the triangular, trapezoidal and gore-shape lots fronting obliquely on the Parkway

by the law of supply and demand. When practically unlimited in supply, it cannot, of course, be advantageously disposed of for business purposes.

Shifting heavy traffic loads, so far as possible, from ordinary streets to express routes will relieve traffic conditions throughout the community. These fast trafficways, by attracting an increasing number of vehicles to themselves, will to that extent ease the traffic burden on other streets. And the parkways in absorbing a generous proportion of the city's traffic will by that very fact discourage the straggling and sprawling business development now all too common on our heavily traveled radial and circumferential streets. With the development of a parkway system, we may reasonably expect a more and more intensive utilization of our logical business centers. We may also reasonably expect that redistribution of the city's traffic will be accompanied with a gradual elimination of many non-conforming business uses that have in the past invaded our residence districts. And it is also likely that both of these tendencies will go hand in hand with a higher basic unit of land value on both our residence and our business districts. Certainly, natural business centers will have less cause to fear the chaos and destruction wrought by chance stores. And surely the elimination of wholesale quantities of fast traffic from the city's streets will make the home sections not only safer but more quiet and peaceful.

A system of parkways equipped with rapid trafficways is obviously something more than so many new thoroughfares laid down on the city plan. In a very real sense they constitute an additional element in the city's plan. Where properly conceived, they have practically revolutionized the main-line movement of traffic. In fixing and stabilizing natural business centers, in re-defining, restoring and giving new character to residence districts, these parkways are putting new life and meaning into both zoning and city planning.

City Managers Discuss Problems and Prepare for Further Progress

THE problem of unemployment relief, reducing expenditures to meet diminishing income, management technique, city manager policies, and training city managership, were some of the subjects which occupied the attention of nearly 200 city managers, various city officials, and other persons interested in government, at the eighteenth annual conference of the International City Managers' Association, held in Louisville, Ky., October 7-10.

"What cities need just now from Washington," said C. A. Dykstra, City Manager of Cincinnati, "is correlated information on employment and a national program of employment agencies and employment distribution." Daniel E. Morgan, of Cleveland, expressed the opinion of those present when he stated that cities should be given official representation on the national and state employment advisory councils. A number of other city managers described the unemployment plans in operation in their cities; Louis Brownlow delivered an address on trends in relief and public welfare, in which he pointed out that there is a definite trend toward the municipality's taking more and more relief activities from the private organizations; and Frank Bane, newly appointed Executive Director of the American Association of Public Welfare Officials, outlined the work which his organization is undertaking with the view of assisting local governments in meeting the unemployment situation.

A number of leading municipal authorities in the United States addressed the conference on problems of interest to municipal administrators. Charles E. Merriam, of the University of Chicago, talked on the problems of metropolitan regions; John B. Blandford, Jr., Director of Safety in Cincinnati, delivered a paper on organization management in city administration; Thomas H. Reed, of the University of Michigan, delivered an address on training for city managership; A. R. Hatton, of Northwestern University, observed that the council-manager plan in the past twenty-three years had proved its stability as a governmental system; and Luther Gulick, of the National Institute of Public Administration, in an address, on the last day of the conference, entitled, "The World Looks at Management," pointed out that governmental research must play a more important part in municipal management if cities hope to render effective service to their citizens.

In regard to Association activities, the Executive Secretary reported a 10 per cent increase in membership, and that the City Manager Yearbook for the first time had been published as a bound volume separate from *Public Management*. It was brought out also that thirteen of the twenty-five cities which adopted the council-manager plan in the year ending June 30 had populations in excess of 25,000. This is the largest number of cities to take such action in any one year since 1925, and it is significant that one out of every five cities with populations of over 25,000 now operate under this form of government. He reported further that the staff organized in 1930 under the auspices of the Association's research committee had made installations of street sanitation records during the past year in Brunswick, Ga., Kenosha, Wis., and Troy, N. Y. Manuals describing these procedures and forms were published for each of these installations and distributed to a large number of cities. The research staff also carried on some work in connection with police records. Donald C. Stone, Research Director, made the installation of a complete police records system in Pasadena, and a manual of police records based on this installation was published in August of this year under the auspices of the International Association of Chiefs of Police.

The new officers elected were: President, Charles A. Carran, City Manager, East Cleveland, Ohio; and Vice-Presidents, George D. Fairtrace, City Manager, Fort Worth, Texas; P. P. Pilcher, City Manager, Winchester, Va.; and C. A. Harrell, City Manager, Portsmouth, Ohio.

The program of the National Conference on Government, November 9-11, in Buffalo, N. Y., is now available. This important gathering will be the joint annual meeting of the American Legislators' Association, the Governmental Research Association, the National Association of Civic Secretaries, and the Proportional Representation League. The program can be secured from any of these organizations or from the Buffalo Municipal Research Bureau, Inc., Buffalo, N. Y.

The Economy of Sand-Asphalt Pavement

By W. E. HAWKINS
Construction Engineer,
North Carolina Highway Department

THE problem of any state having a large road-building program is the difficulty experienced in obtaining an adequate supply of materials that will be satisfactory for construction purposes. Some states are fortunate in having natural deposits of suitable material located in many sections of their boundaries, while others have a limited supply which must serve the requirements for the entire state.

In the geological formation of the eastern part of North Carolina there are no stone or gravel deposits available. Top soil, sand-clay, and bank-gravel are of such inferior quality that they are unsuitable for surfacing purposes. This section of the state has a limited population, spread over a large area, and many miles of roads connecting the small towns and communities.

When the large road-building program was inaugurated in 1921, this situation confronted the State Highway Commission. Funds available for construction purposes were very limited in these undeveloped sections, and to consider the building of a hard-surface pavement would have been unwise. The excessive cost of the transportation of materials made the construction of this type prohibitive; likewise, the volume of traffic did not justify a very expensive road.

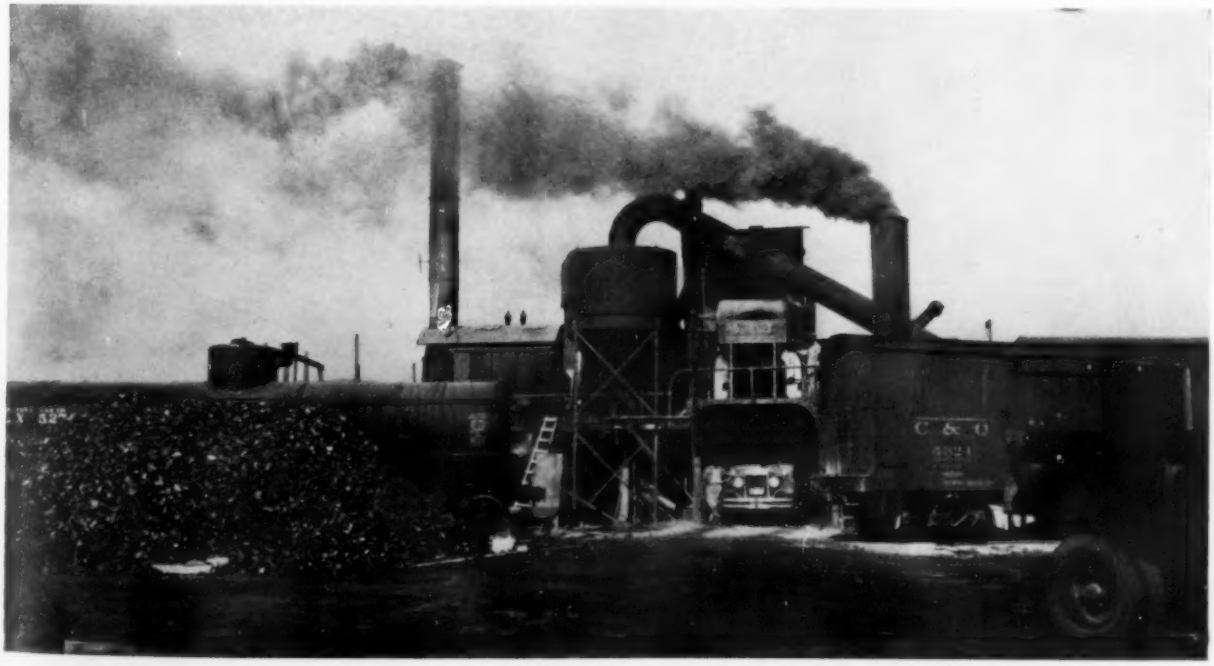
Along the eastern coast of the state and for quite a distance inland, there are vast areas of sand. The problem, therefore, was to develop some type of pavement in which this local material could be utilized. In the late spring of 1922 experiments were conducted with mixtures of local sand and asphalt, and the results were so satisfactory that a continuation of this type of construction was warranted. The subsequent developments were such that during each year since the inauguration of this type of construction additional mileage has been constructed in sections of the state wherever local sand was available and subgrade conditions were suitable for this type of pavement.

In the contemplated construction of a sand-asphalt project the primary investigation should be to ascertain whether or not suitable sand is available on the proposed work. The sand should consist of clean, hard, durable grains, free from clay, loam and other foreign matter. The gradings of the sand used on several recent projects were as follows:

Retained on	Project 3831	Project 3200	Project 3680
40 mesh sieve	20.4%	41.6%	25.0%
80 " "	38.8	35.3	45.6
200 " "	35.6	21.1	24.8
Passing 200	5.2	2.0	4.6

It is essential that uniform gradings be maintained between the 40 and 200 mesh, as this will permit the utilization of finer sand which can be used in this type of work.

The most satisfactory sand is one which closely approximates the grading used in sheet asphalt. Sand of this quality is very rarely available, and therefore it is necessary that care be exercised in balancing the proposed mix. This is accomplished by carefully determining the percentage of voids and establishing a formula in the laboratory which will properly fill the voids. By this method it has been found that sands unsuitable for sheet asphalt, owing



A SIMPLICITY SYSTEM ASPHALT PLANT AT LUMBERTON, N. C.
Operated by Blythe Bros. Co. Note the limedust car at the right and an asphalt tank car at the left

to wide variation from standard grading, can be used satisfactorily in sand-asphalt when none other is available.

Preparation of Subgrade

The character and preparation of the subgrade is a very important factor in the construction of sand-asphalt. In the early stages of this work it was deemed expedient that the subgrade be loose sand, but in later years it was found that a sand-clay subgrade, and in some cases a grade with a high percentage of clay, would make a suitable foundation if proper drainage was provided. The subgrade should be uniformly and firmly compacted, and brought to a firm, unyielding surface before any hot mix is placed thereon.

All unsuitable material encountered in the subgrade, such as excessive clay, vegetable matter, and detrimental soil, should be excavated and replaced with a satisfactory material that will become firm and compact.

Wood Forms Remain in Place

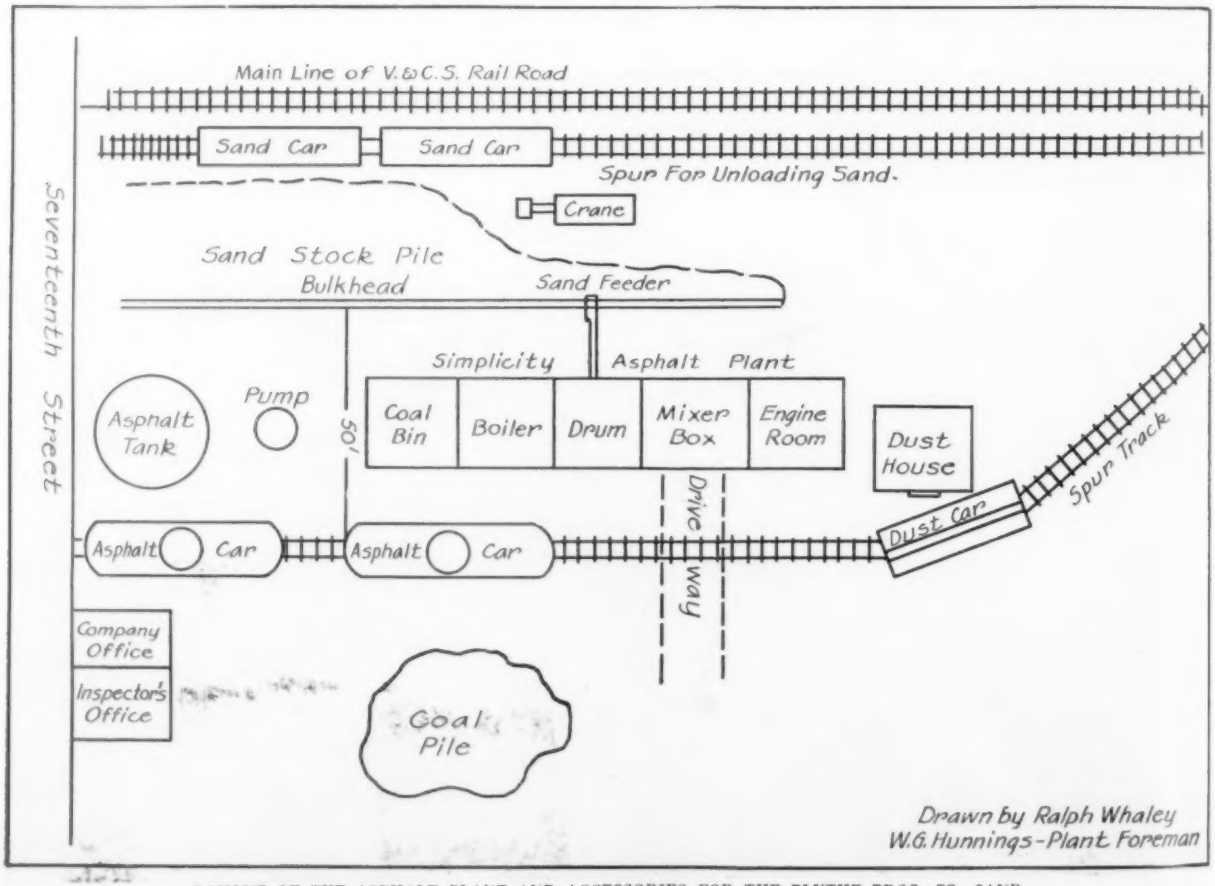
After the completion of rough grading, timber forms are firmly set to line and grade. These forms are 2 x 8-inch, long- or short-leaf pine, cypress, or other satisfactory lumber, 10 to 15 feet in length. The forms are securely staked and left in place after the pavement is completed. Following the form setting a small gang of men prepare the subgrade and complete the fine grading.

Two-Course Paving

The base course mixture, composed of 7½ to 8 per cent asphalt, penetration 50-60, and 92½ to 92 per cent sand, is prepared at the plant and delivered to the road in trucks at a temperature from 300 to 350 degrees Fahrenheit. This mixture is dumped upon a sheet-metal dump-board and shoveled into place on the subgrade. The hot mix is then struck off by a finishing machine to the proper shape and section, and after the material has cooled sufficiently the base course is rolled with an 8- to 10-ton tandem roller until the material is thoroughly compacted; the rolling starting longitudinally at the sides and gradually proceeding toward the center of the pavement. The base surface should be smooth and all irregularities patched before final rolling. From one to two days' run of base course is permitted, which is followed by the placing of the surface course. A squeegee coat of hot asphalt, penetration 50-60, is spread on the base course prior to the laying of the surface. The asphalt is heated in a kettle to a temperature of from 300 to 350 degrees Fahrenheit and applied at the rate of 1/12- to 1/16-gallon per square yard. This squeegee coat is absolutely essential in order to insure a proper bond between the base and surface courses.

The surface course mix of 10 to 10½ per cent asphalt, 8 to 12 per cent filler dust, 82 to 79½ per cent sand, is delivered to the road, spread, and struck off by a finishing machine to the proper shape. The same weight roller is used as on the base, the rolling being done longitudinally, followed by diagonal rolling in two directions.

The base course is laid to a compacted depth of 3 inches, while the surface course is 2 inches in depth. The finished surface of both courses is checked with a 10-foot straight-



LAYOUT OF THE ASPHALT PLANT AND ACCESSORIES FOR THE BLYTHE BROS. CO. SAND-ASPHALT JOB NEAR LUMBERTON, N. C.

edge during rolling operations, and repairs are made where necessary in order that the final surface will be smooth and uniform. Previous to the final rolling of the wearing surface and while the pavement is still warm, a light coating of limestone dust or portland cement is swept over the surface and the rolling continued until the surface course is thoroughly compacted.

The density of the base course averages from 1.80 to 1.95, and the top course averages from 1.95 to 2.10. These average densities are the results of projects that have been constructed in recent years.

Laboratory Control

The asphalt mix is controlled on each project very accurately by a field laboratory in charge of an inspector. In addition, samples of each day's work are forwarded to the laboratory in Raleigh and checked for A. C. content, sand gradings, and density. Should there be any distinct variation between the results of the samples and the daily reports of the inspector, an investigation is made at once. The construction details on the roads are controlled by a roadway inspector. Daily reports are made by both inspectors as to the progress of the work.

Asphalt Plants

The plants used in this type of construction are similar to plants used on other asphalt work except in the size of the cylinders or drums in which the sand is heated and dried. The size and design of the heating drum is an important factor in the output of the plant.

We have constructed many projects on which the plant set-up was adjacent to the railroad. In these cases the plant is located near the sand-pit, and shipments of asphalt and filler dust are unloaded on the plant siding. The sand is transferred from the pit to the plant by means of a gas crane and a ¾-yard clamshell bucket. On projects

PREPARING THE GRADE AND SPREADING THE HOT MIX ON A NORTH CAROLINA SAND-ASPHALT JOB

1. The grade board, used to insure an even subgrade for the hot mix. 2. Setting the wood forms. Note the wedge-shaped stakes. 3. Oiling a truck with kerosene and water before taking on the four hot batches. 4. Dumping the batches on the steel dump board. 5. Shoveling the sand and asphalt from the board to the grade. 6. The sand-asphalt as spread by the finishing machine. Note the iron track on the forms and the form of notched joint. 7. Filling a low spot shown up by the straight-edge

away from a railroad the plant is erected at the sand-pit, the asphalt is hauled in tanks on trucks or in barrels, and the filler dust in sacks. In the construction of a project recently completed near Wilmington, N. C., the asphalt was hauled by trucks for a distance of 30 miles, while the filler dust required a 9-mile haul. Storage tanks equipped with heating coils are erected at the plant so that a reserve supply of asphalt may be kept on hand.

Costs

In recent years sand-asphalt pavements have been constructed 16 and 18 feet in width, at a cost ranging from $1.12 to $1.34 per square yard. In consequence of this low-cost construction, many sections of the state have had roads improved, the building of which would not have been possible had a higher type of construction been considered.

Evolution of Specifications

Changes and improvements have been made from year to year in the details of construction, which have been for the betterment of sand-asphalt work. At present some consideration is being given to one-course construction. Experiments have been made in depth of from 3 to 5 inches compacted, but on account of difficulties experienced in rolling the mix with an 8- to 10-ton tandem, no conclusions have been reached until a 3- or 4-ton tandem has been tried out with pavements of various depths.

The maintenance of these pavements has consisted of repairing surface, filling cracks, and repairing defects in the sub-base, caused by improper drainage conditions. These imperfections developed in the pavements first constructed. In recent years changes have been made in the details of construction which have resulted in an improvement in sand-asphalt.

In some cases the maintenance costs on sections of this pavement are exceedingly moderate. During 1924 there was constructed a 5 1/3-mile project of sand-asphalt, located between Aberdeen and Southern Pines. The traffic between these two points ranges from 800 to 1,000 vehicles per day. The only repairs necessary to this pavement have been an occasional filling of the surface cracks. The pavement at present is in excellent condition, and is rendering satisfactory service. There are other similar sections which have required very little maintenance.

The width of pavement of the original projects started in the state in 1922 was 10 feet. A large portion of this mileage has been reconstructed by adding 3 feet of sand-asphalt base on each side, and the entire width of 16 feet resurfaced. The 10-foot width served traffic purposes for a period of years, but on account of the increase in the volume of traffic it became necessary to widen the old pavement.

Other sections of original construction have been resurfaced by flush-coating an application of bitumen and covering with ¼- to ¾-inch stone chips at 25 pounds per square yard. This method of repair was tried out as an experiment, and it has been very satisfactory.

If local sand is available in any community, subgrade conditions suitable, and the volume of traffic does not justify a high-type, expensive road, a sand-asphalt pavement will be adequate to meet all future requirements. Since 1922 North Carolina has constructed approximately 500 miles of this type and the results have been so satisfactory that the adoption of this kind of construction has been more than justified.

ACKNOWLEDGMENT.—From a paper presented at the Ninth Annual Asphalt Paving Conference.

Photographs Save Time and Money in Municipal Improvement Projects

THERE is a Chinese adage to the effect that one picture is worth ten thousand words. The Bureau of Right of Way and Land, of the Department of Public Works of Los Angeles, is proving the truth of the old adage, and in doing so is saving the city thousands of dollars a year in both time and money.

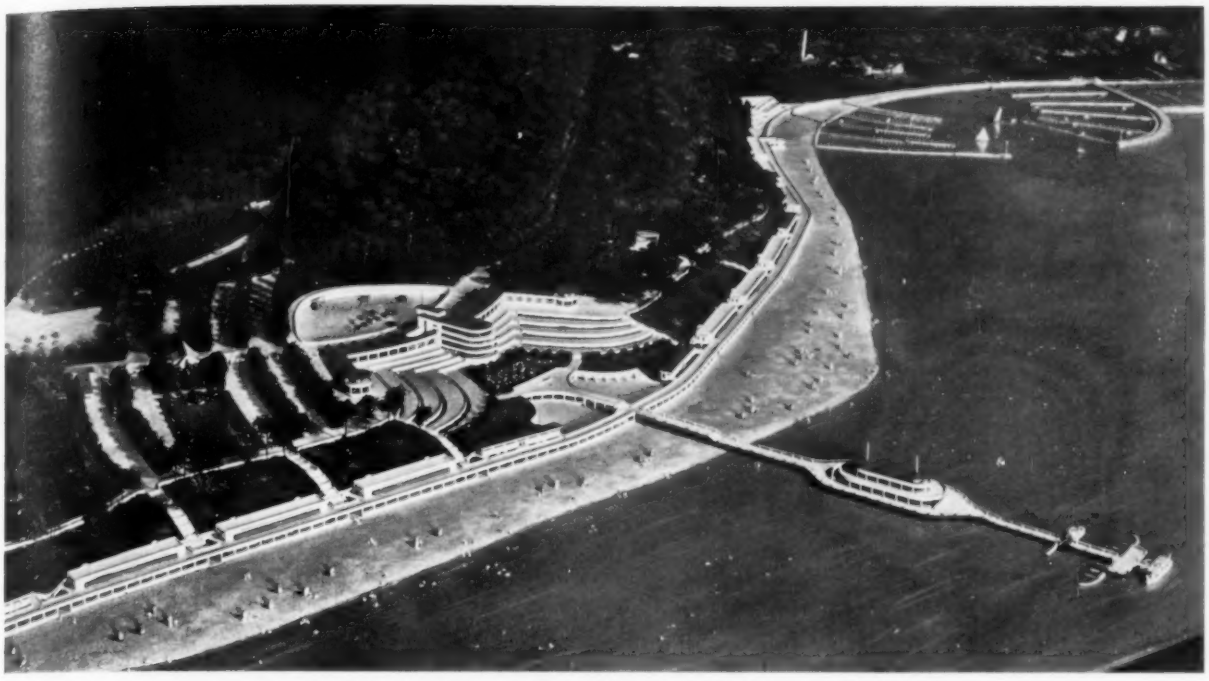
In this Bureau is vested the responsibility for making technical investigations of all public works matters involving real property, and for rendering reports and recommendations on them to the City Council and the Department. In addition to property's being appraised and mapped and its titles searched, it is now regularly photographed. The photographs are indexed and mounted, sections under consideration are outlined and colored, and all essential information is added. They then become a part of the official report and recommendations.

This procedure has been found valuable to city councilmen and board members, since it relieves them of the responsibility of personal investigations. It also saves time when a corporation or a property owner from whom the Bureau wishes to secure an easement lives in another part of the country. A large increase in the easements granted by out-of-town property owners, has, in fact, resulted from this practice.

When a right-of-way is to be purchased, the photographs show surrounding property and the degree of its desirability, so that a fair market value may be arrived at. And there are other practical values: Recently, on two major street-opening projects in Los Angeles, approximately 100 houses were purchased by the city. These houses had to be rented up to the time of moving them from the property. Photographs were used to assist in renting them, and in selling them to house-moving companies and private individuals. In such cases each prospective purchaser can get an idea of the appearance of the houses without going to the site and inspecting each one individually. He can in this way readily pick out those types in which he is interested and which would be suited to the neighborhood to which he intends to move them.

Aerial photographs are used for large areas such as reservoirs, parks, and major street openings, ground pictures for alleys, easements, leases, appraisals of small parcels where detail is desired, or any property being purchased or leased on which there are buildings.

Photographs and their accompanying data are often put to highly technical uses. For instance, if the property shown is to be used for street opening and widening, the traffic hazards and the necessity of a wider street must be brought out. Or, in eminent domain proceedings where benefits may offset severance, any increase in value by the improvement must be shown. Where sanitary sewer and storm-drain easements are to be obtained, it is necessary to show the contour of the ground to bring out the need of locating the easement over a specific portion of the property.



PHOTOGRAPH OF A MODEL OF THE WANNSEE BATHING BEACH

The New Bathhouse and Restaurant at the Wannsee Bathing Beach, Near Berlin

By **STADTBAURAT WAGNER**
Berlin, Germany

THERE is no doubt that the present generation has shown a definite change of attitude toward physical education. The development is by no means restricted to the intensified gymnastic, sport and playground activity of youth, and I believe that we shall live to see a still further development of physical culture, not only in the sense of strengthening bodily powers, but also in the creative molding of these powers under the refinement of cultural influences.

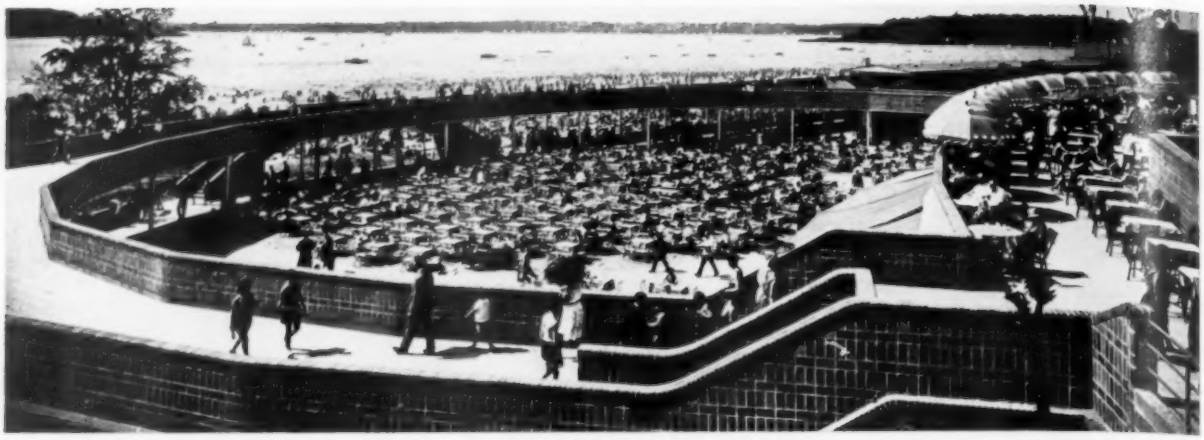
In this connection it seems quite natural that the bath of yesterday should be different from that of today and tomorrow. If the bath of yesterday was only water, the bath of today is water and air and sun and gymnastics, with opportunity for restful contemplation and an environment of esthetic charm. The bath has become a kind of sanitorium for the building-up of physical powers, and is therefore in charge of physicians and hygienists. I believe that this sanitary and hygienic significance of the bath will be still more carefully planned for and emphasized in the future, and that, with it, restaurant service will be maintained as a feature of physical care.

The new buildings of the Wannsee bath at Berlin, here presented, are in layout and program a modest beginning of the public bath of the future for which we long. The construction surely would not have been undertaken in a time of extreme business depression were it not that fire had destroyed a large part of the original wooden buildings erected at Wannsee in 1924 and that during their short existence these buildings had become quite unattractive in surroundings and arrangements. Six years of public bath progress show here the fundamental advance which bathhouse construction has made in our time. If I may pass judgment on the plant, it is this:

Since its opening, it has already become evident that the new facilities are too small, although the building plans extend substantially beyond the old buildings. By extending the hall toward the rear close up to a retaining wall in the forest slope, the bathing place has been enlarged from 50,000 square meters (538,000 square feet) to 80,000 square meters (869,300 square feet). But what are 80,000 square meters when the daily attendance has increased to forty thousand, yes, even to sixty and seventy thousand bathers!

The dressing-rooms, the space for shops, for private baths, and for sanitary conveniences have been doubled and equipped with improved hygienic arrangements (showers, footbaths, etc.) The restaurant space has been quadrupled, and the restaurant garden doubled.

A covered passageway over 1,600 feet long and nearly 20 feet wide leads to these grounds, and, besides serving to distribute the bathers more expeditiously over the whole beach, offers protection in case of sudden rain, and shelter from the sun. This "Promenadenstrasse" has a second story with a gallery of the same length, accessible from the second story of the disrobing hall, with its pri-



THE RESTAURANT, WANNSEE BEACH

vate rooms and lockers. Four roof terraces, each 430 square meters, are built out to be used as sun baths, with showers.

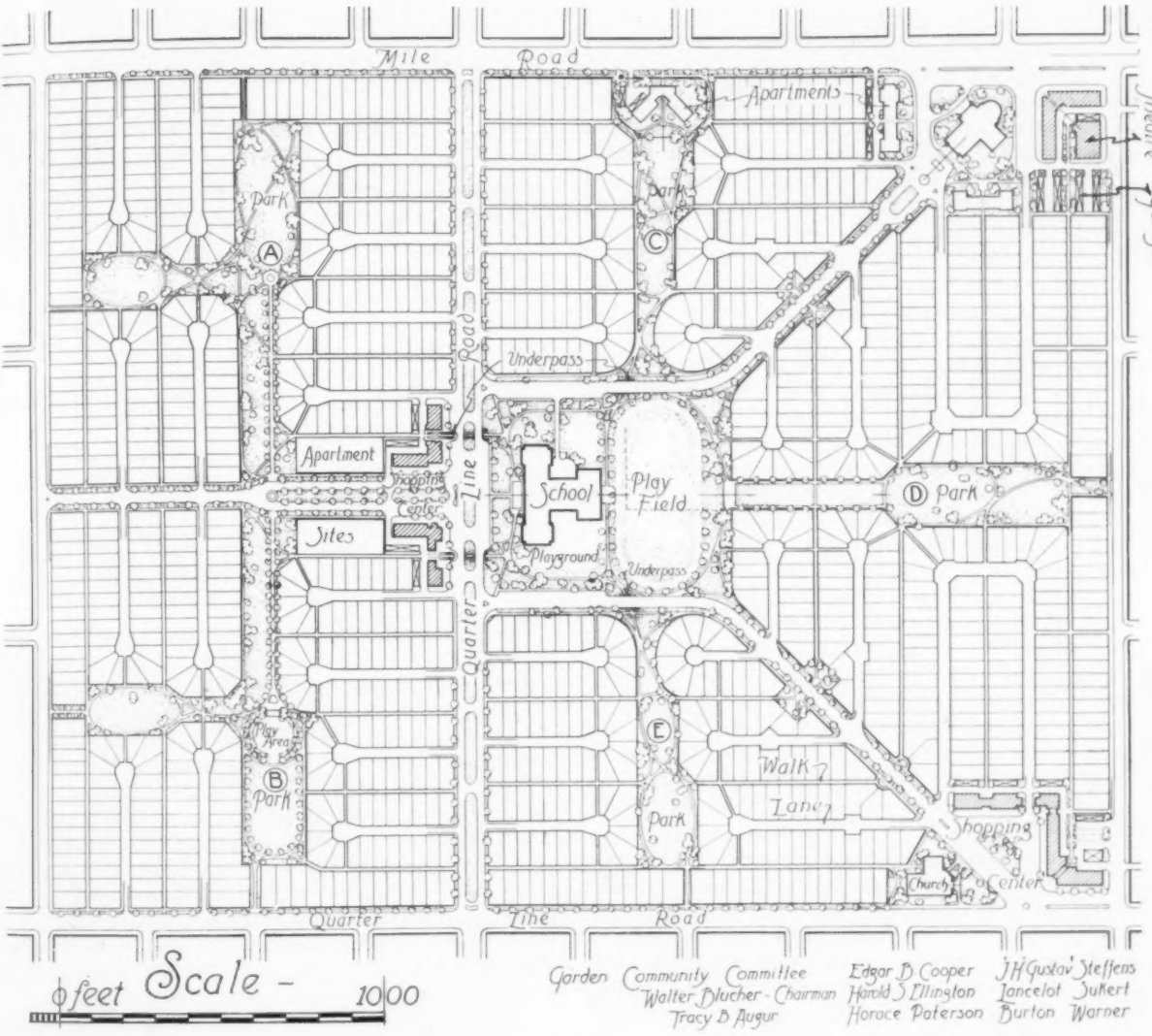
This brief description of the plan does not exhaust the details and the innovations. I wish to add that the entire new structure, including a large incinerator for paper, cost, in round numbers, 2,031,000 marks (about $500,000). Even with interest at 10 per cent, one need not doubt that the cost of construction will be repaid. This bath, which shows an increasing patronage (up to June 12, 1931, 360,000 bathers compared with 160,000 for the same period in the preceding year), and rising rent receipts from the coatroom, the shops, and the restaurant, can also be considered an illustration of how a farsighted and prophetic building plan must prove more profitable from a business point of view.

Whether a complete development of the bathing and recreation facilities according to the accompanying photograph of the general model will be realized is not yet certain. But it is sure that the second period of construction must exceed the first in plan and extent, if it is to raise public bathhouse construction and bathing-beach development to the standards which the coming generation will demand of us.

FOUR VIEWS OF THE DEVELOPMENT

These include the Administration Building (left above), which is at the entrance to the park and beach and which contains a branch post office and police department; the present bathhouse structure; and (below) the upper and the lower promenade levels

Adaptation of Radburn, N. J., Idea Proposed for Detroit Suburb



THE Michigan Housing Association is planning the development of a community on a 200-acre tract near Detroit. The design utilizes the Radburn idea of superblocks, five of which combine to form a compact neighborhood unit with a school and playfield at the center. The school is approached from the largest block without an intervening street, and on the other three sides pedestrian underpasses are provided to carry children from the interior block-path system to the school grounds.

The five blocks contain a total of twenty acres in park land, or exactly 10 per cent of the gross acreage of the tract. The school site takes 5 per cent more, with a net size of ten acres. This site is secured "free," because of the saving in street area over the standard Detroit pattern with all interior streets sixty feet wide. Main streets are of full standard width or more, with extra parking space at all centers.

Lot lines are shown for purposes of comparative study only, since their final location will depend on the type and arrangement of houses. On the basis of forty-foot lots, there are sites for 1,077 single dwellings, five apartments, two churches, and three neighborhood shopping centers. Average lot depths are 110 and 120 feet. Present plans call for the construction of four-, five- and six-room houses, semi-fireproof, to sell completely developed for from $3,500 to $5,000.

The project, when completed, will provide for between 1,000 and 1,200 families, or enough for a complete school district and neighborhood unit. Children will have abundant play space near their homes, and will have no occasion to use the streets either for play or for travel.

The plan was prepared by a committee of members of the Michigan Housing Association, composed of well-known Detroit architects, builders, city planners, engineers, realtors, and others interested in providing better housing facilities for the city's industrial population.

TRACY B. AUGUR,
Landscape Architect, Detroit.

The Business Operation of a Municipal Water Works

THE water system of Waterbury, Conn., is owned and operated by the city. Its management is provided for in the Department of Public Works under the control of the Board of Commissioners of Public Works. The Bureau of Water of that Department, headed by a Superintendent of Water, who also serves as Superintendent of Streets and Sewers, is charged under the Board with repairing, cleaning, general care and supervision of the water system and such other duties as the Board may designate. It does not have the complete management of the system as a business enterprise.

The extension and operation of the system has been financed heretofore as though it were one of the general government activities of the city, rather than as a separate enterprise. Major additions have been provided for by bond issues, chargeable against general taxation. The revenues from operation have gone into the general treasury, and the expenses of operation have been provided for by appropriations from the general funds of the city against the proceeds of taxation. There has been no set of accounts of the water system so maintained as to show the results of its operation and its financial condition from year to year.

In the 1930 appropriations, however, the character of the enterprise as a distinct activity was recognized and a separate water fund was established by action of the Board of Aldermen, designed to provide for the future financial management and accounting of the system as a distinct business activity. It was considered necessary to provide an amount of $205,605.41 from general taxation to cover the estimated deficiency in revenues, and other resources for the operations of the year.

There has been more or less public controversy over the questions involved in the management of the system and extensions to it. In the absence of clear accounting records to show the financial condition of the system, the results of operations, and similar analysis of the present and prospective demands on the system and the availability of supply in relation to the demand, the discussions have been surrounded with confusion and uncertainty.

Two principal alternative plans of operation of the system are possible: (1) continued operation by the city; and (2) operation by private enterprise. Another possibility is that of the transfer of the whole plant and functions, with its related obligations, to a separate municipal corporation formed for the purpose, with jurisdiction extending beyond the limits of Waterbury.

Public Against Private Ownership and Operation

Whether a city should own and operate its water system or should leave this activity to private enterprise is a question of policy rather than principle. Most cities in the United States have adopted the policy of providing this service, largely on the ground that it is too important and vital to the health and welfare of the inhabitants to be left to private enterprise.

A Local Charter Commission Presents a Valuable General Discussion in Its Report on Local Conditions

The question of whether a city should acquire and operate the system is on a somewhat different basis from that of whether a city should continue to hold and operate a system that it already owns and operates. The city in the latter case may be said to have decided its policy, and in the absence of clear and compelling reasons for change, it would be well to give attention to improving the system in operation and removing its defects, rather than to change the entire policy and perhaps thus to fly from evils known to other evils not anticipated.

For these reasons, the continued public operation of the present water system in Waterbury is advocated, but with strengthened provision for the management of its finances and operations on a business basis as a distinct enterprise.

Possibility of a Separate Water District

The possibility of substituting for the city of Waterbury in the management and operation of the local water system a new municipal entity, to be created with functions extending across present municipal boundaries and possibly serving a much more extensive area, constituting a "water district," is well worth consideration. Such a plan, to the extent that other communities need the service and would come in under the plan, could undoubtedly be made to remove the burden now placed on taxation by the deficit for operation, spread the costs of additions and extensions over a larger area and number of people, and, by using a much larger proportion of the available water supply without corresponding increases in cost, the plan would tend to lower the unit costs of water furnished to all consumers. There are available from present sources, and those in process of development, abundant quantities of water so far exceeding any possible needs of the city of Waterbury alone for a long period in the future, that development of a means of realizing upon the surplus should provide a real measure of relief for the present taxpayers and consumers who are carrying the burden.

It is recommended by the Waterbury Charter Commission that a legislative committee be constituted to inquire into the matter. In the absence of such a special water district, the city should take steps to the fullest extent practicable to realize on the possibility of selling the surplus to other communities that need it.

Continued Operation of the System by the City as a Business Enterprise

The report of the Charter Commission, while considering other plans and possibilities, proceeds on the assumption that, at least for some time to come, the city will continue to own and operate the present system, and hence

the report deals with desirable improvements in the plans of management of the system as so administered.

The placing of a water system on its own feet, requiring it to pay its own way and providing for it to function on a strictly business basis as a separate business enterprise, distinct from the general government of the city, should be insisted upon. The present budget set-up of resources and necessary appropriations under a separate special fund provides a start in that direction in Waterbury which should be confirmed and established in the basic law of the city.

A separate governing board or other agency is not necessary if the government of the city as a whole is placed on a basis of responsible management, as is advocated under the proposed new charter for Waterbury. Under any such plan of responsible government, the Board of Aldermen or other responsible legislative authority of the city should have unrestricted control of policies, and the management should be placed in a trained executive experienced in water-system management, who should be responsible to the head of the department for the planning and management if the activity is left as a bureau of such a department as that of Public Works, and through the department head to the Mayor, City Manager or other chief executive responsible for administration as a whole. Naturally, it would be expected that a specialized water executive such as is advocated would not have his functions confused or his efforts dissipated by such unrelated duties as those of supervising street and sewer work, as at present.

If the present type of government should continue, then an independent board with as many safeguards of its independence as possible, and protection against interference, would be desirable.

As matters involving coordination of related work and economy in operation, it would be expected that, in any case, the city's technical engineering staff, the Bureau of Engineering, would continue to render its specialized service to even a larger degree than in the past, but that the cost of such service rendered would be billed to and paid by the water system, preferably by transfer of vouchers between funds and accounts. Also, the collection of water bills by the collector of taxes and the keeping of accounts by the comptroller would be expected to continue, with proper charges for such services and others that it is found desirable for these or other agencies of the city to render. It should have to bear a charge in lieu of taxes comparable to what a privately owned plant of similar size would have to pay.

The Basis of Water Rates

Conversely, the water department should receive credit for all the service that it renders to the city or to any of its departments on exactly the same basis as service rendered to any private consumers. The discussion of water rates which follows is developed on this basis.

What Rates Should Cover.—Water rates should be predicated upon a reasonable and just basis which will produce an amount of revenue sufficient to pay all operating expenses, a reasonable return on the investment in the water-works plant, a reasonable allowance for depreciation of all property, and an amount equivalent to the taxes on the property used that would have to be paid if the property were in private hands. In other words, a water-works plant should pay its way, and on the same general basis, whether municipally or privately owned.

Charges in Proportion to Costs.—The apportionment of the amount of money to be raised from water rates as between the various consumers should be made so far as possible on the basis of costs incurred in serving the consumers. No water should be furnished free. Even the city should be charged for water used in public buildings, for street sprinkling, in parks, and for other public purposes.

The return on the investment is considered to be a part of the cost of supplying water. This, together with the depreciation allowance, should be sufficient to provide for replacements, for additions and extensions, taken over a long period of time, whether financed on a pay-as-you-go basis or by bond issues, the interest and the retirement charges of which must be met from year to year.

It is only fair that charges should be based so far as practicable on the cost of rendering the service. Otherwise, as is the case under such a uniform quantity rate schedule as is now in effect at Waterbury, some consumers will pay more and some will pay less than their proportionate share. Thus, some consumers will be paying part of the cost of furnishing service to other consumers, as well as their own, and the other consumers will be paying less than the cost of furnishing the service that they receive.

There seems to be a strong sentiment in Waterbury, as in many other cities, for the uniform rate plan based on a fancied analogy to taxation. It is maintained that, since the small property owner pays the same rate of taxation as the large property holder without regard to the amount of property taxed, as his contribution to the cost of public service in general, he should not be compelled to pay a higher rate for this one public service of furnishing water. Such a higher rate is held to be a discrimination against the poor in favor of the well-to-do.

The analogy is faulty. The primary purposes of government are to render service to the public as a whole and not to individuals. Hence, taxation to pay for such general public service cannot, and in principle should not, be based on any consideration of individual benefits received from such service. On the other hand, general taxation is commonly regarded as based primarily on the principle of "ability to pay." Hence, many of those who are poorest in income or property are often exempted entirely from any direct tax burdens, even though the benefits received by them may be proportionately large, and those of heavier holdings or returns pay in the same pro-

Not *Whether*, But *How Well*

Here is no discussion of whether a city should own and operate its own water works. Most cities do so, largely on the ground that a service so important and vital to the public health and welfare should not be left to private devices. This is an examination of methods whereby an already publicly owned utility may strengthen the provisions for its financial management and for its operation as a business enterprise.

portion, or even in increasing ratio, as those with less, because they are better able to bear the burden.

But the argument is not the same where a city or other public body undertakes, for what it considers reasons of better service, to render a commercial service that is at best of a quasi-public nature for the direct benefit of the individual served. In such a case the public body is engaging in business and it is not justified in conducting this business along any but fair and just business lines. It certainly could not defend itself as the proprietor of a business in using the powers of government that it happens to have, to take from one customer for the purpose of giving to another, or to make one customer or taxpayer pay for the service rendered to another. Yet, this is just what any rate system would do for a municipally owned public utility that is not based on consideration of a fair distribution of costs, according to service rendered.

Service Charges and Quantity Charges

The most consistent method of making a first gross division of charges in proportion to costs is by means of service charges and quantity charges. The service charge is intended to cover all costs incidental to providing and maintaining a connection with the water mains and serving the customer, except such portions of the connection installation costs as have already been borne by the consumer. It is obvious that the costs are greater for furnishing a given quantity of water in small lots to a hundred different consumers than those of furnishing the same quantity to one large consumer. It is this difference that the service charge is intended in large measure to meet.

In other words, the service charge should cover all costs incurred by the water system in keeping itself in a position of "readiness to serve" the individual consumers as distinguished from the consumers as a body, regardless of the quantities of water used, or even whether any water at all is used, and it should cover also the costs of serving the individual consumers so far as those costs are not related directly to quantities consumed.

The quantity charge is intended to cover all costs incurred in supplying water at the point of service connection. The amount of this charge should depend directly upon the quantity of water used.

The service charge is intended to be in addition to the quantity charge. It is in each case a fixed amount and is to be assessed whether any water is used or not. The service charge is recommended by the New England Water Works Association and has been approved by the Public Utilities Commissions of at least forty states and by the U. S. Bureau of Standards.

Varying Quantity Rates

As the present and prospective sources of supply for Waterbury are ample, and the use of additional quantities of water in the low-pressure district involves little or no additional operating expense, and in the intermediate district only a moderate additional expense, rates should be fixed which will so far as possible encourage increased consumption, especially by large users. This will tend toward making the lowest rate schedule and thus to decrease the rates for the small users as well.

It must be readily apparent that if a business enterprise has for sale, say, 1,000 units of service which cannot be rendered in any other period and there is a demand for but 500 units, it must recover its entire cost from the 500 units sold in order to continue solvent as a business. If it would cost but little or nothing more to render the additional units of service, and if by reducing the price on these units by one-fourth or one-half they could be sold, the result would be an increase of revenue to the extent of 50 to 75 per cent, which would permit a decided reduction of the rate for the first 500 units, with benefit to all concerned.

This is in substance the position in which Waterbury, as well as many another city finds itself with respect to its water system. Waterbury has a bountiful surplus of water which it could supply to consumers at little or no additional cost, if there was demand for it. It certainly would be to the advantage of all consumers if inducement were offered by price concessions for large-quantity use, to create a demand for the surplus, which now runs away, at prices that still would be decidedly beyond the extra cost of furnishing the additional quantities.

The "Block" Plan of Differential Rates for Larger Consumption

It is of course not practicable to figure the bills of each consumer on the basis of the extra cost of supplying him the varying quantities that he uses from month to month, but substantially fair and equitable results are secured by taking the consumers by classes according to the quantities consumed, and fixing the rates by such classes. The block plan of quantity rates is much used in this connection and is intended to promote increased consumption. Both the service charge and the block rates are recommended by the New England Water Works Association.

Under the block plan, later explained in more detail, a flat quantity rate is established for all quantities used by any consumers below a certain maximum. All consumers pay that rate, the same for all on all quantities used, up to the maximum fixed. A slightly lower rate is fixed for consumption within fixed limits over the maximum for the first rate and below the maximum of the second block. There may be three or more blocks, each with a separate rate, the rates gradually decreasing from block to block, but each consumer pays exactly the same rate for his entire consumption as any other consumer within the same block, and it is only on the excess consumption in any higher block that the reduced rate is secured.

To re-state and sum up the argument already presented, the block form of rates more nearly conforms to the principle of making rates on the basis of cost of service than does the single uniform rate. The most advantageous rate basis for each consumer and for each class of consumers when rates are proportioned to produce a given amount of revenue and when the supply of water is ample and the cost of supplying additional quantities is very little, is the basis on which all consumers or other classes of consumers will pay the largest gross amount, not the highest rate, for water.

Additional consumption may be brought about by inducing present consumers to use more water, or by securing additional consumers, or by both these means. The domestic consumer cannot increase his consumption appreciably, as he ordinarily uses all the water he needs under any reasonable rates. Industrial consumers, however, often can secure parts, at least, of their needed supplies from other sources, and generally will do this when rates are high. When there is not much difference in cost, they usually prefer to use the city water. The rate basis

which will induce increased consumption by the individual large consumers to the extent of producing the largest amount of revenue from them will result in the need for the least amount of revenue from the smaller consumer and, in fact, from all other consumers. On the other hand, a low industrial rate that does not have the effect of increasing the gross revenue from large consumers will not benefit the other consumers, and therefore it is not desirable from the standpoint of the latter, except possibly to establish favorable industrial conditions, with a view to attracting additional industrial consumers.

Increases in the number of consumers are dependent on the growth of the city. One factor tending to promote the growth of an industrial city is the securing of new industries, and a condition tending toward that result is an ample and reliable supply of water of good quality at favorable rates.

Fire Protection

An important function of a municipal water system is the furnishing of fire protection. This has required certain expenditures in the construction of the plant, principally for the larger water mains required, and for fire hydrants, additional sources of supply, and pumping equipment to meet emergency demands. A portion of the operating expense also is chargeable to fire protection. It is but fair, therefore, that a portion of the water revenue to be raised should be paid by the city from funds derived from general taxation corresponding in amount to the cost to the system of affording fire protection.

There are three general methods of determining annual fire protection charges. These are based upon:

1. Hydrant rental, a unit charge for each hydrant.
2. A charge for each mile of pipe 6 inches or larger in diameter, with an allowance per hydrant for maintenance.
3. A charge for each inch-foot of pipe 6 inches and larger in diameter, with an allowance per hydrant for maintenance. The inch-foot of a pipe is the product of the diameter in inches by the length in feet.

Some cities, however, charge a round sum without indication of how it is derived, but in most cases it is probably arrived at by use of one of these three methods or a combination of two or all of them. Of these methods, the third is the most logical, as it takes into consideration the number of hydrants, the amount of pipe and the sizes of pipe.

The revenue derived from fire protection charges ordinarily varies from 25 to 35 per cent of the ordinary water revenue, amounting to about $1.25 per capita for large cities and $2 per capita for cities of average size. The Wisconsin Railroad Commission has fixed the amount of these charges on the basis of actual cost as determined by the Commission, such charges amounting to approximately 30 per cent of the gross revenues. Two dollars per capita for Waterbury would give approximately $200,000, which would amount to slightly more than 30 per cent of the revenues necessary to be secured. Some $13,350 of this would be derived from hydrant rentals at $10 a hydrant for the 1,335 hydrants now in use. The remainder, or $186,650 on the inch-foot basis with some 11,700,000 inch-feet of pipe in use, would call for a rate of about 1.6 cents an inch-foot.

The $200,000 so to be provided by a charge against the city is in part offset by the item of some $120,000 to be paid to the city in taxes by the water system, which is one of the charges included in the rate base. The excess of some $80,000 to be paid by the city to the water system over what the water system would pay to the city in taxes can be compared with the $205,000 which the city found it necessary to appropriate from its general revenues from 1930 to make up the deficiency in its water revenue. Some $125,000 less would be charged against taxation under the proposed plan, and the amounts so charged would be in payment for services actually rendered for the benefit of the taxpayers as such and not as consumers. In addition, the city, like any other consumer, would have to pay for the water it uses.

Red Flare Prevents Traffic Interference at Fires

CHIEF DANIEL B. TIERNEY, of the Arlington, Mass., Fire Department, has devised a special flare stop sign which he has found to be very effective for use in the quick establishment of police lines at the scene of a fire, thus assisting the fire department materially in keeping automobiles and crowds of people away from the working area.

The word "Stop" is painted on a metal sign mounted on a rod which fits into a socket base, so that it can be raised or lowered and set at any desired height. In the weighted metal base there is another socket in which is inserted a red signal flare such as is used on the railroads, which gives a brilliant crimson illumination for a period of thirty minutes, providing a warning that cannot be overlooked or mistaken. Additional flares can, of course, be used to prolong the period of warning.

The special service truck of the Arlington Fire Department carries a number of these flare signs, and upon answering an alarm places a sign on each side of the fire a block away; or, if the fire is on a side street, the flare is placed at the entrance to the street from the avenue.

The red danger flare and sign combined serves to prevent traffic from coming into the street and hampering fire department operations. The signs can also be used advantageously by police and public works departments to mark excavations or scenes of accidents where it is necessary to temporarily divert traffic.

H. BELKNAP.

GENERAL VIEW OF THE ACTIVATED SLUDGE SEWAGE TREATMENT PLANT AT COLLINGSWOOD, N. J.

Mechanical Aeration for Domestic Sewage

Operating Results in a Residential Community of 13,000 Population

By **CHARLES W. DARE and WILLIAM E. COLLINGS**
Superintendent and Assistant Superintendent, respectively, Water and Sewerage Department, Collingswood, N. J.

COLLINGSWOOD has a population of 13,000, contributory to its separate sewerage system. There are no manufacturing plants within the borough limits to contribute any trade wastes. There are 30 miles of sewer in Collingswood, and the topography necessitates two pumping stations, one at the westerly end of the borough and one at the east. The pumping station on the far west side, equipped with two Buffalo pumps operated by two 30-horsepower motors, receives the sewage from the easterly station about once in two hours and itself delivers sewage about four times an hour for 3.5 minutes. Thus, the flow at the treatment plant, located on the shore of Newton Creek, is slightly increased when the west side station is operating. The average flow is around 800,000 gallons per day, and the flow for April, 1931, was 894,000 gallons per day as shown by a recording weir on the influent line, which also measures the returned sludge from the final settling tank.

The influent first flows through a small grit chamber, which is cleaned every two weeks. It then flows to the preliminary settling tanks, which have a detention period of about one hour. These tanks also receive the sludge pumped daily from the aeration tank. The preliminary settling tank is divided into two parts, which originally were used in parallel, but now are alternated except during storms, when parallel operation is resumed.

The preliminary settling tanks are each 14.5 feet wide and 45 feet long, and have an 8.5-foot depth of sewage. They are equipped with Link-Belt straight line collectors run by one 2-horsepower motor. The sludge is carried to hoppers, from which it is piped and flows by gravity to the sludge digestion tanks.

Mechanical Aeration for Activated Sludge

From the preliminary settling tanks, the sewage flows to a distributing box which distributes it to any one or a combination of the four aeration tanks, which have already been constructed, leaving room for two additional tanks as they may be needed. Each aeration tank is 125 feet long and 13.5 feet wide, and the sewage is 8.5 feet deep. On one of the long sides of each tank are a series of Link-Belt mechanical aerators with blades or paddles of narrow metal ribbon. The center of the aerators is 3 feet from the side of the tanks, which have all corners rounded to prevent the settling of sludge and possible septic action. A baffle is located 18 inches from the wall on the same side as the aerator, and runs to within 18 inches of the bottom of the tank. The flowing-through period of the sewage is about 6 hours, giving a velocity of 2.5 feet per second. Because of the rotary motion of the sewage induced by the aerators, the flow is actually a spiral in going through the tank. The aerators now operate at 52 revolutions per minute, a speed slightly in excess of the original rate planned. The aerators, which are 123 feet long and 3 feet in diameter, are each operated by a 10-horsepower motor. The bearings are all above water level and are equipped with Alemite pressure greasing equipment, the nipples being carried to the tops of the tanks, and can be easily reached from the walkways.

Final Settling Tanks

The effluent from the aerating tanks flows over a weir to the four-compartment final settling tank, each compartment of which is 14.5 feet wide and 43.5 feet long

and holds 6.5 feet of sewage at the near end. The bottom of each compartment has a drop of about 1 foot from the far end toward the influent end. The settled sludge is returned to the hopper at the near end, by a Link-Belt straight line collector operated by a 3-horsepower motor. The receiving hoppers have perforated pipe, making it possible to flush down the sludge, if necessary.

The sludge from the final settling tanks flows by gravity to a channel along the walls between the sludge beds and the final settling tanks and aerating tanks to a distributing box at one corner of the sludge digestion tanks. Each final settling tank has an adjustable sludge decanter with a V-notch weir which can be raised or lowered from a floor stand on the walkway, thus making it possible to regulate the amount of sludge removed from the tank at any time.

The effluent from the final settling tank flows over rectangular weirs to a conduit and thence to the chlorinating house and a mixing chamber, which measures 12 x 12 feet in plan by 6 feet deep. Following this is the contact tank, 12 feet wide and 33 feet long by 6 feet deep, in which the sewage is well mixed with the chlorine because of the roundabout baffles built on 3-foot centers.

The Distributing Box

In the distributing box an air-lift is installed to raise the activated sludge to the top, whence its flow is regulated by a V-notch weir for each aerating compartment. Approximately 25 per cent of the daily flow received at the plant is returned to the aeration tanks at a point about 15 feet from the influent end. The excess sludge flows to the separate sludge digestion tanks or, if desired, to the preliminary settling tanks. A small amount of air in the distributing box keeps the sludge well stirred to prevent the starting of any septic action.

Sludge Digestion Tank

The separate sludge digestion tank is divided into two compartments, each 31 feet wide by 77 feet long, in which the sludge is about 9 feet deep. The total capacity of the two compartments is about 43,000 cubic feet. The compartments each have two long vertical baffles to prevent short-circuiting of the sludge in flowing through. In order to seed the raw sludge, there is a connection at the effluent end by which sludge may be returned to the influent end.

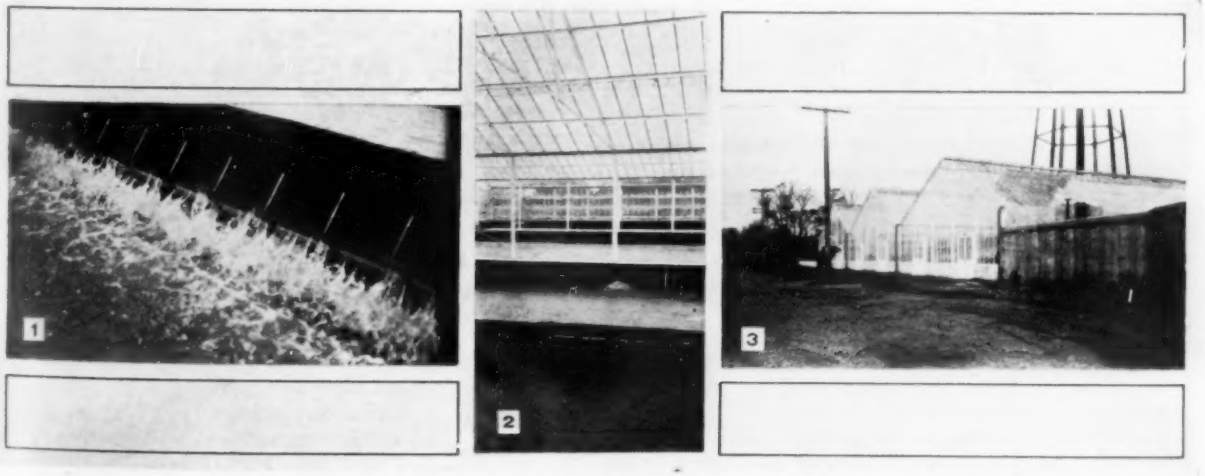
The sludge is treated with lime or copperas, as may be necessary to maintain the pH at 7.2. The sludge digestion tanks are equipped with gas domes with hot water heating pipes run about one inch above the bottom. The pipes are run in the first two sections of each compartment only. It has been found that the heat satisfactorily stirs the sludge through the creation of gas. The collected gas is piped to a heater through a regulator which maintains the temperature in the digestion tank. Coal may be used in the same boiler when gas is not available.

A novel rotary decanting valve for removing the supernatant or subnatant liquor is installed at the discharge end of each sludge digestion tank. The valve, which is a brass tube, has eight slots, each 10 inches long by about 2 inches wide and with 2 inches between the slots, which are arranged spirally down the tube. By merely rotating the tube around an inner pipe which has one long slot, it is possible to draw liquids from any elevation.

Sludge Drying Beds

The digested sludge is removed from the effluent end of the separate digestion tank by a valve sludge riser pipe which feeds to the drying beds. There are eight drying beds, each 20 feet wide by 63 feet long, and six of them are covered by Lord and Burnham glass covers, each with a 40-foot span covering two beds. The sludge enters the drying bed by an 8-inch pipe equipped with a shear gate. The sludge flows entirely by gravity. At times when the supernatant liquor from the sludge digestion tank is turbid, it is run to the beds through a tee and siphon. The sludge, which has been heated experimentally to as high as 80 degrees Fahrenheit, but which is usually maintained at about 68 degrees Fahrenheit, is drawn off about twice a month to the sludge beds. These beds are composed of a top of 6 inches of fine sand, below which is 3 inches of fine stone on a base of 4 to 5 feet of larger stone which composed the old contact beds. These beds are slightly deeper at the center where the drains are located. The liquid draining out from the sludge is returned to the preliminary settling tanks.

Sludge is disposed of by hand shoveling to wheelbar-



AERATION AND SLUDGE DRYING AT THE COLLINGSWOOD SEWAGE TREATMENT PLANT
1. A close-up of the Link-Belt mechanical aerators. 2. Interior of the sludge drying glass-overs. 3. The sludge digestion tank in the foreground and the glass-covered sludge beds

rows and is removed to the shore of Newton Creek or is used as fertilizer as needed about the plant and in the neighborhood.

Some Operating Details

Each day, for about one hour before the preliminary settling tanks are cleaned, the Link-Belt sludge collectors are operated, moving the scum toward the far end and pulling in the sludge to the hopper at the near end. From these tanks the sludge is lifted to the digestion tanks by an air-lift, air for which is furnished by a Nash Hy-Tor compressor.

Air is also used on the final settling tanks for a short period each day to loosen any sludge which may have adhered to the side. It is also used to circulate the sludge in the digestion tanks when necessary.

A pair of powerful floodlights are mounted on the chlorine house, making it possible to illuminate the entire length of the plant from the final settling tanks across the aerating tanks to the preliminary settling tanks and grit chamber, so that the operation of the plant at night can proceed with the same care and precision as during daylight hours.

Operating Results

On May 1, 1931, the biochemical oxygen demand in the influent was 795. This was reduced to 670 in the effluent from the preliminary settling tanks and to 7.7 in the final effluent.

Warning—Ice and Snow Ahead—I

Properties of Ice and Snow Which Must Be Considered by Officials in Charge of Snow Removal

By **JOHN H. NUTTALL**
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WATER passes directly from the liquid to the solid state at the definite temperature of 32 degrees F or 0 degrees C at sea level. The transition from the liquid to the solid state, or vice versa, is direct, and ice does not soften on the application of heat as do pitch and similar substances. The freezing point of water is lowered by salt and other compounds in solution. It is reduced 1.2899 degrees F for each 1 per cent of salt expressed on the basis of the weight of water in the solution. Water holds in solution a definite proportion of its weight in salt at each temperature, increasing with the temperature, and will retain 35.6 per cent of its weight of salt at 32 degrees F and only 30.7 per cent at 7.6 degrees F. It is not possible to reduce the freezing point of water below 7.6 degrees F by the use of salt, as water will hold only the quantity necessary for reducing the freezing point to this temperature.

The melting point of ice is lowered by pressure 0.0311 degrees F for each atmosphere of 14.7 pounds pressure per square inch. When one piece of ice is superimposed upon another, pressure causes the ice to melt at the point of contact, and the relief of pressure because of the melting causes the ice to re-gelatinate or re-freeze, and thus consolidate the two pieces into one.

The specific heat of ice is 0.504 relative to water as 1, which implies that 0.504 B.T.U. is required to raise the temperature of one pound of ice one degree F. The latent heat of fusion, which is the quantity of heat required to transform ice to water without an increase of temperature, is 43.6 B.T.U. for each pound of ice.

Ice differs from almost all other substances in swelling after transition from fluid to solid. One volume of water becomes 1.0855 volumes of ice, and the specific gravity of ice is 0.922 that of water. The increase of volume of ice over that of the water from which it is formed gives rise to great pressures, and a pressure of over 30,000 pounds per square inch may be exerted during formation. Ice expands 0.00002833 of its dimensions for each increase of 1 degree F in temperature.

Pure ice weighs 57.5 pounds per cubic foot, but ice is seldom formed from pure water and is usually lighter because of air bubbles and impurities. Pure ice permits the passage of 1.4510 B.T.U. per hour, per square foot of surface, per inch thick, per degree Fahrenheit difference of temperature on opposite sides of the ice, contrasted with 10.7374 B.T.U. for ordinary soil, so that dirty ice conducts heat better than pure ice. Ice absorbs radiated heat in the ratio of 106, compared with 73 for ordinary soil. As this implies that ice absorbs 1.7 times as much radiated heat as soil, it is evident that a covering of soil prevents ice from melting.

Various samples of ice differ considerably in strength. The average compressive strength of natural ice tested at temperatures between 18 degrees and 23 degrees F is 1,070 pounds per square inch parallel with the water surface and 1,845 pounds per square inch perpendicular to it. Different samples vary 50 per cent each way from these figures. The tensile strength of ice is much less than its compressive strength, being 102 to 256 pounds per square inch. Ice adheres to wood with a force of 30 to 40 pounds per square inch. Ice upon the street is seldom pure for more than a short period, is almost always filled with air bubbles, and may contain as much as 25 per cent of its weight in dirt.

The Properties of Snow

Snow is finely divided ice produced by the direct freezing of water vapor. Individual particles of snow are pure, solid ice, but snow as a whole differs considerably from ice in its thermal and physical charactertistics. The surface of snow exposed to air is much greater than ice for equal weights of material, which causes snow to melt more quickly than an equal weight of ice upon the application of heat. Fresh snow weighs 5 to 12 pounds per

cubic foot, and 12 to 50 pounds per cubic foot when compacted by rain.

Snow slush is not composed of softened individual pieces of snow, but of snow crystals melted on the outside and surrounded by water. Wet slush consists of crystals or groups of crystals in suspension in water. Slush weighs 20 to 50 pounds per cubic foot when too solid to run.

Fresh snow will permit the passage of 0.7545 B.T.U. per hour, per square foot of surface, per inch of thickness, per degree of difference in temperature on opposite sides, compared with 1.4510 B.T.U. for ice. The greater resistance of snow to the passage of heat is caused by the fact that snow contains a high proportion of air, which only passes 0.1643 B.T.U.

Snow is compacted into ice by pressure and the re-freezing of its crystals and also by thawing and re-freezing of the crystals and water. Transformation into ice is also effected by saturation with rain followed by freezing. Ice formed from snow by any of these factors is never so solid as ice frozen directly from pure water, and is always full of voids and dirt.

Snow melts by the absorption of radiated heat, by direct conduction from surrounding substances, and also sublimes, which is the direct transformation from the solid to the vapor state. Snow upon the street gradually accumulates impurities and may contain over 25 per cent of its weight in dirt.

Formation of Snow

Air has capacity for containing a certain amount of water vapor at various temperatures, the capacity increasing with rise of temperature. When air contains all the vapor which it is possible to hold at a certain temperature, it is saturated, or of 100 per cent humidity. Smaller quantities of vapor at any temperature are expressed in percentage of humidity with the maximum quantity possible for that temperature taken as 100 per cent. When saturated air is warmed, the humidity decreases to less than 100 per cent unless there is additional vapor which it may absorb to bring the humidity to the increased quantity necessary for saturation at the increased temperature.

When saturated air is cooled, it must lose some of the vapor which it contains and the condensed vapor must fall toward the earth by the action of gravity. When a stratum of saturated air above the earth is cooled at temperatures above 32 degrees F, the excess moisture is precipitated in the form of rain. If the rain falls toward the earth through strata at temperatures above 32 degree F, it continues in the form of rain, but if it passes through strata at temperatures below 32 degrees F of sufficient depth for freezing, it becomes hail or sleet. When saturated air is cooled at temperatures below 32 degrees F, the excess vapor freezes from the vapor state and is precipitated in the form of snow. If the snow passes through strata at temperatures above 32 degrees F, it is transformed into rain or sleet. Precipitation is accelerated by minute particles of solid matter suspended in the air, which act as a focus for the condensation of excess vapor.

Snowstorms

The quantity of precipitation depends upon the amount of moisture in the air before chilling and the depth and temperature of the chilled strata. Less moisture is contained in air at low temperatures than at higher, and a heavy snow is more likely to occur at temperatures near 32 degrees F than at lower temperatures. It is never too cold to snow at temperatures encountered in the United States. Large flakes of snow are produced more readily at high freezing temperatures, because the air contains a greater quantity of vapor, and small flakes are produced at lower temperatures, as the vapor is less in quantity.

The depth of snow is dependent upon the character of the snow, the intensity of precipitation and the duration of the precipitation. The intensity is dependent upon the temperature and the depth of strata. The duration of all is short for local storms, as the vapor in the air is soon precipitated; and long for general storms, as additional vapor-laden air reaches a locality after the air from which the snow has been precipitated has passed.

The annual depth of snow varies according to latitude, altitude, topography and the presence of water bodies, and is not constant for any locality nor the same for cities located only a short distance apart. New York, which is within a short distance from Philadelphia, has a considerably greater snowfall than the latter city. The precipitation is affected principally by latitude and altitude, as is shown by official Government snow contour maps.

The number of snows, the period between snowfalls, the length of the snow season, the character of snow, and the depth and duration of individual snows, are not constant for any locality, year or period of years. Conditions are complicated further by the character of wind accompanying a snowfall, which may be of any intensity or direction. The following snow table shows the average depth of snowfall throughout the United States:

	Average Annual Snowfall in Inches for Entire States	No. of Days with Snow	Days with Snow Cover
Maine	126	50	120
Vermont	101	50	120
New Hampshire	105	50	120
New York	85	50	105
Michigan	73	52	95
Wisconsin	61	45	100
Minnesota	44	51	100
North Dakota	41	50	110
Massachusetts	77	32	90
Pennsylvania	50	39	55
West Virginia	47	40	45
South Dakota	45	35	60
Connecticut	73	25	60
Iowa	31	25	60
Rhode Island	48	25	50
Ohio	30	25	45
Nebraska	28	25	45
Indiana	27	25	45
Illinois	25	25	45
New Jersey	45	25	20
Missouri	20	15	32
Maryland & Delaware	25	15	20
Kansas	15	15	28
Virginia	15	15	20
Kentucky	15	15	20

The depth of precipitation does not indicate the relative importance of snowstorms, as light storms when drifted by high winds may cause more obstruction to traffic than a deep, heavy snow which does not drift. The influence of wind on snowfalls is further complicated by the topography and character of buildings surrounding any area on which precipitation occurs.

The second portion of this article will cover: Conditions following Storms; Formation of Ice; Disappearance of Snow; Reasons for Snow Removal; Responsibility for Removal; and Scope of Removal.

Surfacing a City Pavement with Asphaltic Gravel

Town of 5,000 Population Lays 50,000 Square Yards by Contract

SPREADING HOT ASPHALTIC GRAVEL IN ROCHESTER, MICH., PAVING

ASPHALTIC gravel, one of the latest types of paving mixtures used in the program for low-cost roads, was the material employed in an extensive surfacing project recently completed in Rochester, Mich., by Claude B. Talbot, contractor, of Detroit, Mich. Rochester is a town of about 5,000 population, situated about 26 miles northeast of Detroit and 10 miles east of Pontiac, Mich. Most of its streets were graveled over natural earth and base and had become solidly compacted by traffic. The main street had been paved with concrete, as it is a state route to north Michigan points. Also, one or two state route feeders were paved within the town limits.

Each year the village has spent considerable sums for chloride and other dust-laying materials. With a good gravel producer adjacent to the town, the Village Council, noting the success of the adjoining McComb County with its asphaltic gravel pavements, decided to pave most of the main residential streets of Rochester during the summer of 1931. A contract was awarded for about 2 miles of paving, but as the work progressed, the townspeople gradually increased their order to approximately 50,000 square yards, and they have intimated that they will complete the entire city in 1932.

Advantages of Asphaltic Gravel Plant

McComb County was one of the first to try asphaltic gravel, covering a large mileage of county roads with material taken from several of the county-owned gravel pits at a cost of less than $5,000 per mile. Asphaltic gravel consists of bank-run mineral aggregate, screened to remove stone over ¾-inch in size, and mixed with the proper percentage of bitumen. It can be laid either hot or cold, depending upon the kind of asphaltic oil employed.

This material opens a wider market to sand and gravel producers as well as offering to road and street and highway officials a wearing surface for existing compacted dirt and graveled highways at a nominal cost. The expense, it is claimed, is about one-quarter of that of portland cement concrete and one-half that of older asphaltic pavement. A number of states are using this type of mix and others are considering it. Advocates of the use of asphaltic gravel consider it more satisfactory than the "mixed-in-place" methods. It is mixed in the gravel pit, thus eliminating the haulage of raw material, and involves only the transportation of the finished product.

It is claimed that the fresh, new gravel gives cleaner aggregate, more evenly divided, and assures adequate heat treatment, exact proportioning of asphalt and more uniform mixing. Asphaltic gravel makes a dense, watertight, compacted pavement, which is essential to prevent breaking up under traffic or freezing out in winter. Longer life is thus obtained.

The plan of using old road material, scraped together and mixed in place after spraying with hot or cold road oil, involves the danger of excessive powdered aggregates, and of the presence of ingredients undesirable in an asphaltic mix. If the old material is treated with hot oil, there is no assurance of proper heating unless it is removed to some central plant, as is done with pre-mix material.

The Work in Rochester

The preliminary work in Rochester included grading the streets to remove surplus dirt or gravel, making provision for drainage at intersections, and providing for future curbs so as to allow for a top coat of asphaltic gravel 3 inches thick before compaction and 2½ inches thick after rolling. The streets were opened to traffic a few hours after rolling was completed.

The gravel was obtained from the pit of John G. Kemler, three miles from the town. No special processing was necessary. The run-of-bank material was carried by a belt conveyor from the bank to the top of the bins, where it passed through screens to exclude stone over ¾-inch size, but it was not washed. The gravel contained normal moisture, not over 8 per cent, and was fed directly into the contractor's portable heating and mixing plant. The gravel-pit owners' subcontract included hauling the hot mix in steel-body dump trucks a distance of three miles to Rochester. The bodies were kept oiled to prevent sticking, and the loads were covered with canvas en route to retain heat.

The Portable Pre-Mixing Asphalt Plant

The paving contractor used a Chausse portable asphalt plant for the pre-mixing of the asphaltic gravel. This plant consists of two units, both mounted on steel wheels with solid rubber tires, so that the plant may be readily and quickly moved. On this job the machine was cribbed up because of the high water level in the pit, which prevented digging a deeper runway for loading the trucks.

The first unit is the drier. Aggregate from the pit bin was fed directly into a large hopper, from which it passed to the rotating sand drier; there the material was thoroughly dried, and heated to about 300 degrees F. and discharged into an elevator attached to the other unit.

The elevator raises the heated aggregate and discharges it into a self-measuring device and thence into a continuous blade type pug-mixer. At the same time, the bitumen, which was being heated in the 950-gallon tank, was pumped into a measuring device connected to the aggregate measure. The asphalt measure is adjustable so that any amount of bitumen up to 10 per cent can be admitted into the pug-mixer. On this job between 5 and 6 per cent bitumen was used.

From the pug-mill the hot mix dropped into the storage bin, which was equipped with a movable bottom gate operated by the truck driver. The plant can also be used in making standard formula asphalt paving mixes, using crushed rock and sand, and either for hot or cold laying. The Chausse plant, made by the Chausse Oil Burner Co., of Elkhart, Ind., is equipped with two Hercules engines, oil burners, an American exhaust blower, and a small Worthington air compressor.

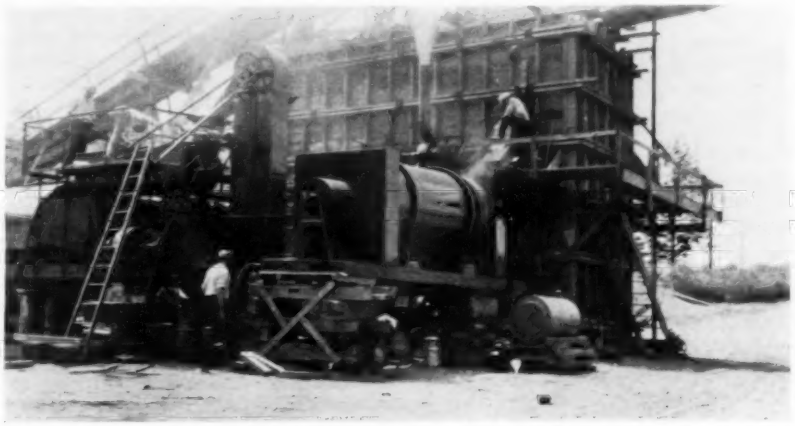
Labor Organization

The general contractor handled all of the work with the exception of the hauling of the hot mix. He employed thirteen men for the job, consisting of one foreman, two plant operators, four shovelers and rakers on the road, one man setting forms, one roller operator, one driver with a tank truck to carry asphalt from the tank car to the plant, one fireman for the tank car heater, and two watchmen. In addition, the subcontractor employed three or four men driving the trucks, and usually two men in the gravel pit.

Costs

The total operating cost was about $4 per ton for the asphaltic gravel completely laid and rolled. This figure includes all material and labor as well as interest and depreciation on equipment. It further includes, with ample margin, the cost of the roadway complete at about $1,500 per mile per inch of compacted thickness 20 feet wide.

The method of installing the asphalt plant in the gravel pit next to the gravel bins was economical and worked out admirably, as the only hauling required was that of the finished product to the points of application. The haul of 3 miles showed practically no loss of heat, and it is felt that a haul of 15 to 18 miles would have been entirely feasible. The material was laid at an average temperature of 275 degrees F. About half a day was needed to make the plant ready for hauling to any other location.



THE PORTABLE ASPHALT PLANT IN WHICH THE GRAVEL AND ASPHALT WERE MIXED

The Legal Significance of the Motives of City Councils

WHAT attitudes do the courts assume in regard to the motives prompting the actions of city councils when these actions become matters of litigation? Professor Charles Kneier, of the University of Illinois, says in the *Georgetown Law Journal*:

"A study of judicial review of the motives of municipal councils indicates that when performing a purely legislative act, they have, in general, the same position of immunity enjoyed by state legislatures. In most jurisdictions, however, the immunity of the acts of state legislatures from fraud does not extend to even the purely legislative acts of the city council.

"The scope of judicial review of the motives of a city council for its administrative acts is much broader. In this field there can be no question as to review for fraud. And in some jurisdictions the courts will invalidate administrative acts on the grounds of improper motives, as interest of a councilman in the project, other than as a citizen or property owner, or intent to benefit a few property owners. In other states, however, it has been held that even though the acts are done in an administrative capacity, the courts will not inquire into the motives of the council except in cases of fraud or corruption.

"The rule of non-judicial review of the motives of a city council when acting in a legislative capacity which has developed seems proper. In the field of administrative action, however, as granting franchises or letting contracts, the opportunities for abuse are such that it seems well that the courts have considered the motives and declared the acts of the council void where they have been found to be improper. Certainly does this hold in case of fraud. As stated by one authority, municipal councils 'have too often shown themselves capable of using their powers fraudulently for their own advantage or to the injury of others.'

"While we may take the view that the responsibility of the members of the council is to the electorate, where fraud or betrayal of public trust is shown, it seems as if the courts should declare such acts void. But to attempt to review improper motives generally would be too broad. It would burden the courts with litigation and probably without improving the efficiency of local administration. And as stated by the Supreme Court of the United States: "'The diverse character of such motives, and the impossibility of penetrating into the hearts of men and ascertaining the truth, precludes all such inquiries as impracticable and futile.'" (113 U. S. 703.)

Paying for Good Housing by Saving the Cost of Bad Housing*

By EDITH ELMER WOOD

SOME day America will inevitably awake to the cost of bad housing. The wanton wastefulness of it will trouble the American sense of efficiency. As the progressive manufacturer ruthlessly scraps obsolete machinery, though it represents a large investment of capital, so will the up-to-date town systematically scrap its obsolete dwellings.

Of course, the task is colossal. If, as we claim, a third of our American homes are bad enough to be demolished, that would involve the building of some nine million new ones. With standardization, quantity production, and the use in some places of multiple dwellings, it is possible that it could be done at an average cost of about $4,000 per family, or some 36 billion dollars; or when we add the excessive price which would probably be paid for some slum property, let us say 40 billion. It is pretty appalling of course. But look at the other side.

We Are Now Paying in Deaths, Sickness and Crime

How much do our obsolete dwellings cost us yearly in preventable deaths, sickness and crime? The question is asked in a purely economic sense. Human happiness and human misery cannot be weighed in such scales. But we can learn considerable without leaving the practical field of dollars and cents.

. . . If New Zealand can keep her death rate down to 8 + per thousand, we should surely not be content in the United States with 12 +. If densely populated Holland can get below 10 and debt-burdened England and Germany lose only 11 and a fraction, should we not feel humiliated at losing 12? A difference of one per thousand in a population of 122 million means the loss of 122,000 lives a year, which might be saved if we were ready to take the trouble. At the rough-and-ready figure of $5,000 per life, that means a yearly financial loss to the nation of $610,000,000. . . .

Death rates, however, tell only a part of the story. Only a small fraction of illness results in deaths, but all illness involves financial loss. . . . According to Dr. Ray Lyman Wilbur, who is Chairman of the Committee on the Cost of Medical Care (in a statement to the press May 22, 1928), the "cost of illness to the people of the United States is probably more than five billion dollars a year." . . . Assuming . . . that only half of existing illness is preventable, and taking Dr. Wilbur's low total, we should have two and a half billion dollars as the annual loss from this source.

Our third great national waste is crime. . . . Nearly every study recognizes the coincidence between bad housing areas and juvenile delinquency. It has frequently been said that 90 per cent of juvenile delinquents came from physically bad homes. . . . When immigration was checked, the last wave stayed where it was. It is only in the past few years that we have seen boys and girls who were born in our slums come to maturity in the same ugly surroundings, with small likelihood of getting away from them except for the gifted few—or by the easy short-cut of crime. May this not be one among the causes of our recent crime epidemic? . . .

While fully admitting the provisional character of the available figures, we feel little doubt that the truth lies somewhere between the extremes offered in the following table as indicating the pecuniary saving that would be effected annually by tearing down our nine million worst homes and building the same number of good ones.

By reduction in number of deaths, from 1.5 to 2 billion dollars.
By reduction in amount of illness, from 1.25 to 2.25 billion dollars.
By reduction in amount of crime, from 1.5 to 10 billion dollars.
Total saving, from 4.25 to 14.25 billion dollars.

It Could Be Done

The 40* billion dollars which looked so hopelessly vast when we spoke of it . . . does not seem so formidable now, for we see how we could save it in from three to ten years, and all after that would be clear profit. If the cost of that gigantic slum-clearance and re-housing scheme were all borne by the taxpayers as in the case of the public schools,—which no one would dream of suggesting,—if it were all outgo and no income, it might still be the best investment the country ever made. For the first time since we got away from the pioneer stage, it would give every American child something like an even break to show the stuff that was in him.

The American Construction Council should not permit its proposal of a 10-year nation-wide program of rebuilding slum districts to be forgotten or pigeonholed. It is much more economically sound as a means of ending unemployment than the accepted multiplying of public expenditures for roads and post office buildings which we could perfectly well do without for a while. It is, in fact, the most statesmanlike proposal yet made for turning hard times into good ones. One of the factors that brought prosperity back to France after the war was that until the devastated regions were rebuilt there could be no unemployment. Can we not have vision enough to rebuild our devastated regions without waiting for a war to destroy them?

Wanted: a Major Statesman to make Housing on the Grand Scale the chief plank in his platform.

* From Mrs. Wood's book on "Recent Trends in American Housing," just published by The Macmillan Company, New York.

* The American Construction Council . . . speaks of a probable expenditure of 50 to 100 billion dollars in the 10-year program it advocates. The two ideas are not, however, precisely comparable.

PRESIDENT'S HOUSING CONFERENCE TO MEET DECEMBER 2 TO 5

THE great national conference on housing, for which preparations have been under way for more than a year under the leadership of President Hoover, and with Secretary of Commerce Lamont as Chairman, and Dr. John M. Gries as Executive Secretary, is to meet in Washington, December 2 to 5. The scope of this gathering of some 1,000 representative citizens from the 48 states promises to be much broader than the title given to the meeting—the President's Conference on Home Building and Home Ownership—would indicate.

Reports will be submitted by 25 committees, and 6 correlating groups, on which about 400 persons have been serving. The importance of the conference to municipal officials and civic organizations is indicated by such committee titles as "City Planning and Zoning," "Utilities for Houses," "Subdivision Layout," "Blighted Areas and Slums," "Finance," "Taxation," "Negro Housing," "Large-Scale Operations," and "Industrial Decentralization and Housing."

The correlating committees will concern themselves with standards and objectives, research, legislation and administration, education and service, organization programs—local and national, and technological developments.

In announcing the plans for the December meeting, President Hoover said:

"It should be possible in our country for any person of sound character and industrious habits to provide himself with adequate and suitable housing and preferably to own his own home." It is hoped that this important conference, the first of its kind on this scale in the United States, will bring appreciably nearer the day when the President's wish will become a reality.

New Pension Plan for Municipal Employees Effective in Cincinnati

A plan for the establishment of a sound retirement system for pensioning disabled and superannuated municipal employees went into effect in Cincinnati, Ohio, on August 1. It was prepared by George B. Buck, consulting actuary, under the auspices of the Cincinnati Bureau of Municipal Research, which has issued it as its Report No. 31. The police and firemen of Cincinnati have had pension funds, which, under the plan, are to be continued for the benefit of those already in these two services, unless individual members decide to come under the new plan. It is provided, however, that new entrants into the police and fire departments will be participants in this proposed comprehensive plan for the municipal employees in general.

The main provisions of the retirement system are summarized below.

Membership of System

The membership of the system will be composed as follows:

(a) All employees of the city of Cincinnati are eligible, with the following exceptions:

(1) Officers and employees of the University of Cincinnati.

(2) Persons employed at hourly rates, and temporary employees.

(3) Councilman, Clerk of Council, officers and employees who receive no salary, judges of the Municipal Court and their employees, the Clerk of the Municipal Court and his employees, the City Manager, the City Solicitor, the directors of the Departments of Public Utilities, Safety and Public Works, and the City Auditor, unless they become members and were in the retirement system at the time that they were employed in the capacity noted above.

(b) All employees eligible for membership who are in service on the date of establishment who desire to become members may do so. If they wish to receive credit for service rendered prior to the date of the establishment of the system they must join during the six-month period following such date.

(c) All new employees who enter the various city departments after the establishment of the retirement system are required to become members as a condition of their employment, unless ineligible for membership as provided under (a) above.

Administration

(a) The administration of the retirement system will be vested in a Board of Trustees consisting of seven members as follows:

(1) The Mayor of the city of Cincinnati, ex-officio

(2) The Chairman of the Finance Committee of the City Council, ex-officio

(3) The City Manager, ex-officio

(4) The President of the Civil Service Commission, ex-officio

(5) One member of the Police Force elected by the policemen

(6) One member of the Fire Force elected by the firemen

(7) One general employee elected by the general employees

(b) The term of office of members of the Board of Trustees of the Retirement System will be six years or for the term of office for which elected or appointed if they are ex-officio members.

(c) The members of the Board of Trustees of the Retirement System will receive no compensation for their service other than their regular compensation from the city if any. The City Auditor and his employees will act as secretary of the Board without additional compensation.

(d) The Board of Trustees of the Retirement System will act upon all applications for retirement and for the payment of benefits in accordance with the retirement ordinance. It will maintain the membership records necessary, arrange for technical services, invest the funds of the system and be responsible for all work incident to the operation of the system.

Service Benefit

Condition for Allowance

Upon the demand of any employee who has attained the age of 60, a retirement allowance is to be granted. Retirement is compulsory at age 70, unless an employee is allowed to remain by affirmative action by the city.

Amount of Benefit

The retirement allowance will be approximately 1/70 of the average annual salary of the employee for the last 10 years of service,* multiplied by the number of years of service rendered prior to the date of retirement.

The retirement allowance will consist of two parts, an annuity provided by the contributions of the employee and a pension provided by the city.

The annuity will be exactly equal in value to the accumulated contributions of the employee at the time he retires. Employees' contributions are set to provide in the average case at the retirement age an annuity of 1/140 of the average final compensation multiplied by the number of years of membership in the retirement system.

The pension will be 1/140 of the average final compensation of the employee multiplied by his years of membership, i.e., approximately equal to his annuity.

In addition, if an employee has had service before the establishment of the system, the city will provide an additional pension of 1/70 of his average final compensation multiplied by the number of years of service prior to the establishment of the system, not exceeding 35.

The maximum total pension to be provided by the city is to be $3,000 per annum.

Disability Due to Ordinary Causes

Condition for Allowance

Upon the occurrence of disability due to causes not the result of an accident in the actual performance of duty, an employee who has completed 10 years of creditable service is to be granted a retirement allowance.

Amount of Benefit

The total benefit will be figured at 9/10 of the regular benefit to which an employee would be entitled after the same period of service were he retired upon a service allowance. A minimum allowance of 25 per cent is provided, with the exception that no allowance shall exceed 9/10 of the rate of allowance to which the member would have been entitled at age 60.

The contributions of the employee with interest are used to provide an annuity, and the city provides a pension which with this annuity is sufficient to provide the total allowance.

Disability Due to Accident in the Actual Performance of Duty

Condition for Allowance

Upon the occurrence of disability due to causes resulting from an accident in the actual performance of duty, regardless of the age or length of service of the employee, a retirement allowance is to be granted.

Amount of Benefit

The retirement benefit will consist of a pension equal to 66 2/3 per cent of the average final compensation of the employee, and an annuity equal in value to the contributions made by the employee together with interest.

Any benefits payable under the state compensation law on account of such disability shall be offset against the benefit allowable under the retirement ordinance. This benefit will be paid when employees are not covered by the com-

* The average salary of the employee for the last 10 years of service is hereinafter referred to as "average final compensation."

pensation benefits, and when possible, the excess of the amount herein described over the amount of the workmen's compensation benefit will be paid.

Death Due to Ordinary Causes

Condition for Allowance

Upon the death of an employee which is not the result of an accident in the actual performance of duty, an ordinary death benefit is to be paid to such person having an insurable interest in his life as he shall have nominated in accordance with the ordinance.

Amount of Benefit

All contributions made by the employee with interest are returned to his estate or designated beneficiary. In addition to his contributions, a benefit equal to a lump-sum payment of 50 per cent of the compensation received by the employee during the year immediately preceding his death is payable.

Death Due to Accident in the Actual Performance of Duty

Condition for Allowance

Upon the death of an employee resulting from an accident in the actual performance of duty, his widow, or, if there is no widow, his children under 18 years of age, or, if there are no children, his dependent parents, shall receive a pension from the retirement system regardless of the age and service of the employee.

Amount of Benefit

The accidental death benefit shall consist of a pension of one-half of the average final compensation of the employee payable to the widow or dependent parents until remarriage or death, or to the children until they attain the age of 18. In addition, all contributions made by the employee prior to his death plus interest accumulations shall be paid to his estate or designated beneficiary. If there is no widow, dependent parent or child under 18 surviving the member, his death shall be treated as a death due to ordinary causes.

Any benefits payable under the state compensation law on account of such accidental death shall be offset against the benefit allowable under the retirement ordinance. This benefit will be paid when employees are not covered by the compensation benefits, and when possible, the excess of the amount herein described over the amount of the workmen's compensation benefit will be paid.

Return of Contributions

A full return of the employee's contributions with interest accumulations is made to the employee upon separation from service without a retirement allowance, and upon the death of an employee a full return is made to his estate or designated beneficiary.

Special Privileges at Retirement

Employees upon retirement may elect to receive their retirement allowances in any one of the following forms, which are computed to be equivalent:

(a) Full amount payable in monthly instalments throughout the life of the employee, all payments ceasing at death.

(b) Option 1.—Reduced annuity payments during life, with a provision that in case of death before such annuity payments have equaled the value of his contributions at the date of retirement, the balance shall be paid to his estate or designated beneficiary.

(c) Option 2.—Reduced retirement allowance, with the provision that at the death of the employee pensioner the amount of his allowance shall be continued throughout the life of such other person as he shall have designated at the time of his retirement.

(d) Option 3.—Reduced retirement allowance, with the provision that at the death of the employee pensioner one-half of the amount of his benefit shall be continued throughout the life of such other person as he shall have designated at the time of his retirement.

Contributions by Employees

(a) Employees are to contribute a definite percentage of their salaries, determined by sex, occupation, and age at the time of beginning membership. They range from 4.14 per cent to 7.71 per cent.

(b) The initial rate payable by the employee is computed to remain unchanged to retirement.

(c) The rates payable by employees are computed by the use of mortality tables and interest tables. Each employee must put into the fund every year such an amount that when he becomes age 60 his contributions accumulated with interest at 4 per cent per annum will be sufficient to provide approximately one-half of his retirement allowance on account of service as a member.

(d) At retirement, contributors are to receive the exact annuities which their contributions will provide. In case of withdrawal before reaching the retirement age, the amount contributed with interest will be returned to the contributor, or in the case of death, to his estate, or designated beneficiary. Upon disability due to ordinary causes the disabled employee's contributions will be used toward the provision of the total disability allowance payable, the balance being made up by the city.

Contributions by City

(a) The city will make annual contributions on account of each member of the retirement system sufficient to provide for the service, disability and death benefits payable by the city, on account of service rendered while the employee is a member. For employees in service when the system is established, the city will make additional contributions so that their total retirement allowances may be approximately equal to the allowances which they would have received had the system been in operation when they first entered the service.

(b) The contributions on account of membership service, or the normal contributions, will begin at 3.23 per cent when only general employees are covered and increase ultimately to 4.26 per cent when future firemen and policemen are covered.

(c) The contributions on account of past service, or the accrued liability contributions, will average 1.64 per cent of the payroll. The accrued liability contribution will be discontinued in about 30 years.

(d) The total contributions of the city will therefore be 4.87 per cent of payroll at the outset.

Wise Municipal Expenditures Now May Mean Future Savings for Taxpayers

EMPHASIZING the fact that every worthy citizen who is in trouble at this time through unemployment would much prefer to work for a bare living wage than to accept charity from anyone, the Pittsburgh Equitable Meter Company, in its *Water Works Journal* for September, 1931, offers some pertinent suggestions:

"It is entirely satisfactory to most taxpayers to make expenditures at the present time which will result in future economies. No one can object to doing work at the present time which it is certain will have to be done during the next five years. Experts agree that materials can be purchased in the present market at prices that are far below cost, and, therefore, are far less than the prices will be when common sense has come back to the frightened business man and investor. Installation of sewage facilities, water-supply systems and public improvements of every kind should be encouraged with the understanding that only the works which are estimated to be absolutely necessary over the next five years are undertaken at present. Such work will provide labor for a large number of men and will tide them over the next few months until employment is on the increase. The extra cost of carrying these improvements will be taken care of by the very saving which can be made in both labor and material at present.

"A number of cities have adopted the sensible program of increasing public improvements to provide work at this time. The installation of water meters is advisable in any community, and the funds provided for the purchase and installation of water meters can easily be carried and repaid from the savings to the water-works department when unnecessary waste is eliminated. The very severe drought of 1930 demonstrated that many communities which thought they had ample water supplies have been running dangerously close to the point of water scarcity."

City Growth and Congestion as Revealed by the 1930 Census

FROM Volume 1, "Population: Number and Distribution of Inhabitants,"* of the Fifteenth Census of the United States, and from an advance summary of a forthcoming bulletin on Metropolitan Districts, the following facts bearing on city growth and congestion of population have been compiled:

In the Federal census of 1800 only 18 of the 93 cities which now have populations in excess of 100,000 were listed at all. The largest was the city of New York (now the borough of Manhattan) with a population of 60,515. Philadelphia was second, with 41,220, and Baltimore third, with 26,514.

Chicago did not appear in the census enumeration until 1840, when it was credited with 4,470 population. Kansas City, Mo., made its first appearance in 1860, with 4,418; Seattle and Oakland, Calif., in 1870, with 1,107 and 4,759 respectively; Dallas and Forth Worth, Texas, and Birmingham, Ala., in 1880, with 10,358, 6,663 and 3,086 respectively; and Oklahoma City, Okla., in 1890, with 4,151.

The Bureau of the Census defines as urban areas all cities and other incorporated places having 2,500 inhabitants and more; also townships and other political subdivisions (not incorporated as municipalities, nor containing any areas so incorporated) having a total population of 10,000 or more, and a population density of 1,000 or more per square mile. On the basis of this classification, the 56.2 per cent of the total population of the United States in 1930 was urban, and 43.8 per cent rural.

The total number of places of 8,000 inhabitants and more in 1930 was 1,208, comprising 49.1 per cent of the total population of the United States. When the census of 1800 was taken, there were only 6 such places. The number grew to 85 in 1850, to 547 in 1900, 768 in 1910, and 924 in 1920.

The total population of the 48 states and the District of Columbia in 1930 was 122,775,046. The territory classed as urban included 3,165 places, divided as follows:

Places of 1,000,000 or more	5
Places of 500,000 to 1,000,000	8
Places of 250,000 to 500,000	24
Places of 100,000 to 250,000	56
Places of 50,000 to 10,000	98
Places of 25,000 to 50,000	185
Places of 10,000 to 25,000	606
Places of 5,000 to 10,000	851
Places of 2,500 to 5,000	1,332

The total land area of the United States is 2,973,776 square miles. As this means a density of population of only 41.3 persons per square mile, it is a striking indication of the absurdity of much of our city congestion. Or let us consider the most densely settled regions in the United States—the 95 metropolitan districts as established by the Bureau of the Census, each having an aggregate population of 100,000 or more, and containing one or more central cities of 50,000 or more inhabitants. In these metropolitan regions we find 54,589,972 persons living in an area of 36,314 square miles—an average of 1,503 per square mile. Here is nearly 45 per cent of the population of the United States living on little more than 1 per cent of the land area.

There are hopeful indications of the approaching end of extreme congestion in great cities in the fact that the suburban area outside the central cities in the 95 metropolitan regions represents almost nine-tenths of the area of these districts, and that in most cases the percentage increase of the outside population during the last ten years has been considerably larger than that of the central city itself. To list a few striking examples:

Metropolitan District	Increase in Population, 1920–1930: Central City	Rest of District
Baltimore, Md.	9.7 per cent	72.2 per cent
Cleveland, Ohio	11.8 " "	125.8 " "
Denver, Colo.	12.2 " "	79.9 " "
Grand Rapids, Mich.	22.5 " "	131.9 " "
Indianapolis, Ind.	15.9 " "	80.4 " "
New Haven, Conn.	0.1 " "	36.0 " "
Philadelphia, Pa.	7.0 " "	42.6 " "
Reading, Pa.	3.1 " "	61.6 " "
Richmond, Va.	6.6 " "	61.8 " "
Rochester, N. Y.	10.9 " "	112.4 " "
Spokane, Wash.	6.6 " "	35.6 " "
Tacoma, Wash.	9.4 " "	35.0 " "

If the entire population of the United States were to live in well-planned cities and villages, and if the density of residential sections were to range from one family to ten families per acre (with an average, say, of five families or twenty-two persons per acre), these residential sections would occupy an average of less than two acres out of each square mile. If an additional acre of the 640 which comprise each square mile were assigned to business and industry, and 2 acres to streets, parks, public buildings and public open spaces, there would still be left 635 acres of each square mile—or more than 99 per cent of the land area of the United States—for farms, forests, transportation, national and state parks and other than dwelling needs.

As Raymond Unwin asked years ago, and as THE AMERICAN CITY has repeatedly asked since, "What is gained by overcrowding?"

*For sale by the Superintendent of Documents, Washington, D. C. 1,268 pages, buckram binding. $2.00.

These Secretaries Were Honored for Services to Their Communities

FIVE cash prizes were awarded to chamber of commerce secretaries at the Toledo convention of the National Association of Commercial Organization Secretaries on October 20, for the best community service ideas submitted during the year.

The Winners

First prize, $100 cash, to W. G. Gaston, Gastonia, N. C., for an effective plan of restoring community confidence after the closing of the First National Bank of Gastonia, by raising $500,000 and reopening the institution. A large-scale financial disaster was thus averted.

Second prize, $50 cash, to W. H. Foster, Rome, Ga., for service to farmers in the community trade area. A diversified agricultural program was launched in a strictly cotton-producing section, the Chamber of Commerce undertaking the creation of markets for the substitute crops.

Third prize, $25 cash, to J. C. Beukema, Muskegon, Mich., for efforts which led to the establishment by three principal trunk-line operators of a car ferry bridge across the lake, the construction of a belt line, and the development by the Federal Government of a $2,134,000 harbor. Water-borne commerce had been on the wane since 1890. Now Muskegon expects to become the largest car ferry port in the world.

Fourth prize, $15, to George W. Elliott, Philadelphia, Pa., for direct stimulation of foreign trade. A traveling exhibit of locally made goods was carried by airplane to various South American cities.

Fifth prize, $10, to W. G. Warren, Rochester, N. H., for the story of what a Chamber of Commerce has accomplished as a service to its unemployed through a subsidiary corporation of the Chamber.

Five honorable mention awards were made, two to the winners of the first and third prizes for other reported accomplishments; the other three to Fred L. Weede, Asheville, N. C.; W. C. Flandon, Columbia, Miss. (Marion County Chamber of Commerce); and T. A. Stevenson, Tacoma, Wash.

New Officers and Directors of NACOS

Gerrish Gassaway, Secretary-Manager of the Chamber of Commerce of Wilmington, Del., former Secretary-Treasurer of NACOS, succeeds William J. Russell as President.

Christy Thomas, Seattle, Wash., succeeds Harry J. Bell as First Vice-President, and A. J. Horn, of Toledo, succeeds J. F. Ferguson as Second Vice-President.

J. H. Hott, Manager of the Fort Worth Association of Commerce, succeeds Mr. Gassaway as Secretary-Treasurer.

Mrs. Norma McKellops continues as Assistant Secretary-Treasurer.

New Directors are Glen B. Eastburn, Omaha, Nebr., M. D. Liming, Boston, Mass., B. F. Moomaw, Roanoke, Va., and W. B. Morey, Lancaster, Pa. Re-elected to membership in the Board of Directors were C. M. Anderson, Memphis, Tenn., H. J. Bell, Milwaukee, Wis., Gerrish Gassaway, Wilmington, Del., A. J. Horn, Toledo, Ohio, J. H. Hott, Fort Worth, Texas, C. C. Lydick, Moline, Ill., and Christy Thomas, Seattle, Wash.

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz

Institute Elects Officers and Directors

AT its second annual meeting in Chicago on October 15, the Institute of Traffic Engineers elected the following officers: Ernest P. Goodrich, President; Burton W. Marsh, Vice-President; Hawley S. Simpson, Secretary-Treasurer; William S. Canning, Director, one year; Lewis W. McIntyre, Director, one year; Guy Kelcey, Director, two years; Roger L. Morrison, Director, two years.

Left-Hand Turn Regulation in Washington, D. C.

WHEN the new left-hand turn regulation went into effect in Washington on September 15, another stumbling block was removed from the road to uniform traffic regulations. The new turn is consistent with that recommended by the National Conference on Street and Highway Safety.

Since the congestion problem is centered at the intersection, the turning of vehicles is of great importance. Unless turning movements are made from the proper lanes, the through traffic is blocked. Motorists are in great need of education as to the use of lanes, and particularly at intersections.

Some cities have been successful in backing up this education by forcing those in the left-turn lane to turn left, and those in the right-turn lane to turn right.

Over 90 Per Cent of Motor Accidents Attributable to Human Factor

OF all the factors influencing traffic accidents, the automobile is least responsible, according to studies completed by the Albert Russel Erskine Bureau for Street Traffic Research, of Harvard University. These studies indicate that human nature has not adjusted itself to take full advantage of the perfection of the modern vehicle.

Dr. Miller McClintock, Director of the Bureau, states: "Not only in number but in percentage, these defects in humanity run so far ahead of defects in the automobile as to make it instantaneously obvious that we have ourselves to blame. The simple fact is that mankind has created a mechanical device which functions far more efficiently than does man himself. The remedy is apparently education and more education, to convince man that he must live up to his car."

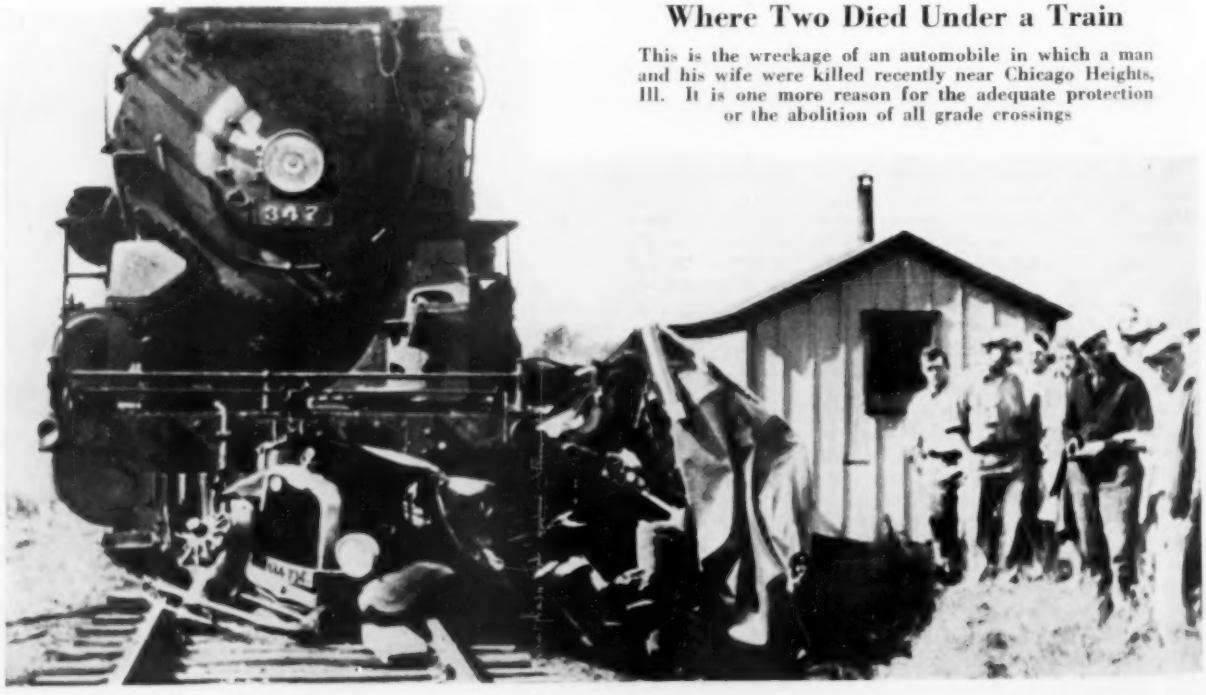
Study of over a million accidents reveals that defective brakes caused 3.4 per cent; lack of chains 1.4 per cent; glaring headlights, 1.3 per cent; punctures and blowouts, 1.2 per cent; and defective steering gear, lights being out, and all other defects together, mounted up to only 3.8 per cent. The entire share of fatal accidents attributable to the cars is therefore 11.1 per cent. For non-fatal accidents, the automobile had defects in only 5 per cent. Only one in ten accidents can properly be attributed to the automobile, which leaves the glaring fact that 90 per cent and over are the result of bad human judgment, human carelessness, or human stupidity.

The Accident Situation in Pennsylvania

THE Bureau of Motor Vehicles of the state of Pennsylvania reports that the first six months of 1931, as compared with the similar period of 1930, showed a decrease of 1.8 per cent in the total number of accidents. Increases of 5.8 per cent and 1.7 per cent in fatalities and personal injuries were apparent, however.

In all but 22 per cent of the accidents reported during the first six months of 1931, operators were apparently guilty of some violation of the Vehicle Code. During the same period of 1930 this percentage was 92. For both of these periods excessive speed was the greatest single cause of accidents, and driving on the wrong side of the road and driving off the highway were given as the next greatest causes of accidents.

A greater percentage of passenger cars were involved in accidents during 1931 than in 1930, while commercial vehicles, taxicabs and omnibuses were involved in smaller proportions of accidents.



Where Two Died Under a Train

This is the wreckage of an automobile in which a man and his wife were killed recently near Chicago Heights, Ill. It is one more reason for the adequate protection or the abolition of all grade crossings

The Use of Reflector Signs for Traffic Safety

By **J. S. DRILLETTE**
Vice-President,
Louisville Frog, Switch & Signal Co.

REFLECTOR signs and materials have been greatly improved during the last two or three years in efficiency as well as in lasting qualities. Several years ago sheet glass reflectors were used extensively at road intersections or other hazardous places to indicate DANGER. A good many of these reflecting units were not efficiently protected against tarnishing or dimming of the reflector, nor were they protected against damage by vandals or mischievous children; therefore, the present type of reflector has had to overcome the bad reputation established by the old type.

Not only has the greater part of the ill feeling towards reflectors been overcome, but rather remarkable progress has been made for such a new device, in such a short time, as can be testified by the traveling public.

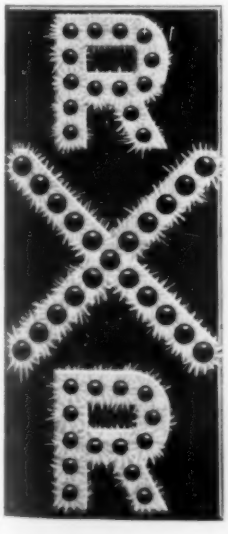
Characteristics of Modern Reflector Buttons

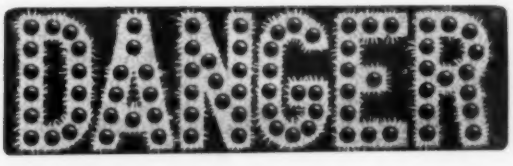
Most of the modern reflectors, at least of the button type, are of heavy shock-absorbing glass and are generally used as ¾ to 1 inch in diameter, which are assembled to form any design that may be desired. The glass is designed to reflect from 75 to 90 per cent of the light that strikes it, and because these rays are returned almost directly to the source, they are extremely bright in comparison with the headlight used.

Although the rays of light are returned directly to the source, the angularity of the most efficient button is such that if the sign is approached from either side of the normal and at an angle within 30° of the normal, it will be visible and plainly legible with very little decrease in efficiency. It is not necessary to have greater angularity than 30° because, as an example, a letter which is 4½ inches wide appears only about 3 inches wide when approached at an angle of 45°; therefore, ordinary letters are hardly legible when approached at such angles. Furthermore, reflector buttons and greater angularity than 35° are not, as a rule, fully efficient when approached head on.

Cities, counties, states and railroads have found many practical uses for reflector signs and buttons. Street intersections where it is necessary for traffic to halt are being marked with reflector type signs, and many accidents are thus being eliminated, for at night as well as in daytime the transient is made aware of the necessity to stop.

Reflector letters less than 4-inch can hardly be made legible to the degree of efficiency desired, because of the fact that modern automobile traffic travels on an average of 30 miles per hour and if a sign is to be read it must be legible at a minimum of 150 feet. It is my opinion that letters under 4 inches in height will appear more as a blur, whether illuminated or not, at even this minimum distance of 150 feet; therefore, most manufacturers are recommending that 8-inch-high letters be used. Where space is limited, instead of endeavoring to explain by the use of small letters why one should stop, or to give the cause for hazard, it is recommended that a mass of octagonal or square shape be installed, and it has been found that this has a psychological effect on automobile drivers similar to the red lantern so much used in the past, and causes him to remove his foot from the accelerator and place his car under control for immediate stopping.





Application of Reflector Signs

Along our main highways where efficient highway engineers are installing reflector arrows and words like CURVE and STOP to indicate special conditions, the night traveler is running far less hazard than where only the sheet-metal signs which are legible during the daylight hours are used. Narrow bridges are being marked by using standard diamond-shaped NARROW BRIDGE reflector signs, or the bridge heads are being plainly indicated by attaching octagonal or square units permanently to the bridge head, so that the driver, even at a distance of four or five hundred feet, may know the limits within which he must stay. Many who have traveled over well-marked roads at night, or even during foggy weather, can well appreciate the advantages and increased safety due to the illuminated reflector arrows and cautionary indications.

These reflectors, or buttons, as they are usually called, do not reduce the efficiency of a sign for day usage, if the width of the strokes of the letters is ample, and, further, they do not attract particular attention except at night when a light from an automobile or headlamp shines on them.

It is understood that Massachusetts is planning to illuminate its entire highway number system and all cautionary or danger signs with reflector buttons.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Municipal Utilities

A city cannot be required to furnish electric service outside its boundaries, nor at the same rates as within the city, in the absence of controlling statute.

One living outside defendant's boundaries was not entitled to a writ compelling the city to furnish electric service from its municipal plant at the same rate charged for service within the city, because no such statutory duty rested upon the city, said the Minnesota Supreme Court in the case of *Guth v. City of Staples*, 237 N. W. 411. The opinion recognized a right to sell surplus current outside the city limits, but not the right of an outside property owner to compel the making of a contract nor to sue to establish a reasonable rate. In part, the opinion reads:

"That there may be a different charge between residents and outsiders is obvious. The city and its inhabitants have the burden and risk of operating the electric plant. The loss through damage or destruction of the plant by accident or by the elements falls upon the city. The non-residents purchasing electric service bear no part of it. An accident resulting in personal injury or property damage through the fault of the city is paid by taxes levied upon property of the city—not by taxes on outside property. The city suffers from the natural depreciation in value of its plant. The adjacent territory does not share it. For these reasons, and others that perhaps might be assigned, there is justly a difference in rate to residents and to non-residents, who pay for what they get with no attendant or contingent risks. The parties should meet on a fair basis; those outside the city realizing that they are at some disadvantage because they live outside and that they are relieved of some risks, and the city realizing, if the fact be so, that there is profit in extending the service which it must furnish its inhabitants. If upon fair consideration the parties cannot get together, the condition must remain as it is unless there be further legislation."

Street Improvements

Irregularities in proceedings will not excuse a city from paying the reasonable value of a beneficial improvement retained by the city.

In a case (*Columbian Title & Trust Co. v. City of Tribune*, 298 Pac. 798), converted from one to recover on city warrants issued for a street improvement to one to recover the reasonable value of the labor and materials furnished for the improvement, the Kansas Supreme Court allowed judgment. The following is an official summary of one of the points decided:

"Where there is no want of authority in a city of the third class to improve its streets, and labor is performed and material purchased by the direction and under the supervision of the city, and it has received and is retaining the benefits of such labor and material, the city cannot escape liability for the reasonable value of such work actually done and material furnished, under the direction and supervision of the city officers, because of mere irregularities in its own proceedings and its failure to fully and formally comply with all the requirements and provisions of the statutes with regard to ordering such improvements to be made, employment of persons for such purpose, or in settlement or appropriation of money therefor."

Bridge Improvements

Municipal authorities' determination as to need for a bridge held conclusive in the absence of fraud.

Proceedings by defendant to construct a system of causeways and bridges nearly a mile long over Mission Bay, San Diego, were attacked by owners of property subject to assessment. An opinion of the California Supreme Court, embodying 38 different propositions of law, upholds the proceedings. (*Southlands Co. v. City of San Diego*, 297 Pac. 521.)

Several of the points decided recognize the right of a municipality to bridge navigable water on securing appropriate state or Federal consent. Perhaps the most important declaration in the opinion is the following one:

"It appears to us clear that under the general power to construct and improve highways conferred upon municipalities by the provisions of the statute a municipality has the power to construct a bridge over navigable or non-navigable waters, whenever in the opinion of the local legislative body it becomes reasonably necessary in such construction or improvement to construct such a bridge, and, in the absence of fraud, finding of that body that such a bridge is necessary, is conclusive and not subject to review. We do not see how the mere fact that five-sevenths of the cost of the improvement is to be expended on the construction of the bridge, determines that, as a matter of fact, such bridge is not incidental to, or reasonably connected with, the construction and improvement of a highway."

Tax Collections

Beneficiary of an irregular adjustment of tax liability was not entitled to challenge the validity of notes and security voluntarily given.

A corporation being unable to presently redeem land sold to the borough of Ft. Lee, N. J., for taxes, made an adjustment under which the borough received a mortgage to secure notes given for payment in installments of the amount due. When suit was brought to recover on the notes and foreclose the mortgage, the corporation challenged the validity of those papers, on the ground that it was ultra vires—beyond the power of—the borough to receive notes, instead of cash, for the payment of taxes. Said the Court of Chancery on that contention (*Dintenfass v. Willat Film Corporation*, 154 Atl. 546):

"But, conceding that to be a fact, it constitutes no defense or bar to complainants' rights to enforce payment of the said notes and mortgage, because defendant has received the full benefit of the alleged ultra vires agreement. By reason of said agreement, the right of possession and to the receipt of the rents, issues, and profits of the realty, although vested in the borough by reason of its being the holder of the certificate of tax sale, was reserved to the defendant; in addition to this, defendant was permitted to pay the taxes assessed against said property for the years 1922 and 1923 in five annual installments, bearing interest at only 6 per cent, instead of at 8 per cent, which was the rate charged on delinquent taxes.

"The borough, having in good faith performed its part of said agreement, and the defendant, as above indicated, having received the benefit of said performance, it now comes too late for the defendant to claim or set up the defense that said agreement was ultra vires."

Bathing Beaches

Diving board over shallow water at municipal bathing beach, without adequate warnings, is an actionable nuisance.

The doctrine that a municipality is not liable for injuries inflicted through negligent performance of governmental duties did not exempt defendant from liability for injury to a young man who dived into shallow water at a municipal bathing beach, according to the decision of the Connecticut Supreme Court of Errors in the case of *Hoffman v. City of Bristol*, 155 Atl. 499.

The theory of the decision was that maintaining a diving board over water that was only 3 or 3½ feet deep, without adequate warnings of the danger, constituted a nuisance. The Court said in part:

"Where a municipal corporation creates and maintains a nuisance, it is liable for damages to any person suffering special injury therefrom, irrespective of whether the misfeasance or nonfeasance causing the nuisance also constituted negligence. This liability cannot be avoided on the ground that the municipality was exercising governmental functions or powers, even in jur-

jsdictions where, as here, immunity is afforded from liability for negligence in the performance of such functions. . . . 'If the natural tendency of the act complained of is to create danger and inflict injury upon person or property, it may properly be found a nuisance as a matter of fact; but, if the act in its inherent nature is so hazardous as to make the danger extreme and serious injury so probable as to be almost a certainty, it should be held a nuisance as a matter of law.'"

Gambling Nuisances

City could condemn slot machines used in gambling, but not proceed jointly against machines operated at different times and places by different owners.

In *Lee v. City of Birmingham*, 135 So. 314, the Alabama Supreme Court found that, under local statutes, the city could sue to condemn slot machines used in gambling, but held that the suit could not be maintained because it was brought against machines owned by different persons having no connection with each other. The machines were seized at different times and different places.

On the first branch of the case, the Court said:

"By state law it is made a criminal offense to set up or operate a wheel of fortune, slot machine, or device of chance . . . also any gift enterprise. . . . Slot machines by which goods are distributed in amounts or values determined by chance, and therefore gambling devices, are prohibited by those statutes. . . .

"The city had the undoubted right to enact similar ordinances. . . .

"It is held by respectable authority that, if a gambling device is prohibited by statute, its operation may be considered a nuisance, and abated upon proper proceedings. . . .

"It is our opinion that the statutes and principles to which we have referred clearly intend to authorize a proceeding in equity to abate and condemn as contraband machines whose nature is such that they were intended to be and are used as gambling devices or gift enterprises."

Sidewalk Accidents

Statutory notice of defect in sidewalk obstruction authorized by city held not prerequisite to damage claim by injured pedestrian.

The city of Binghamton was not entitled to stautory notice of a defect in a false front which it had permitted a building owner to temporarily maintain on a sidewalk while the building was being repaired, before the city could be held liable to a pedestrian injured through fall of the front, declared the Appellate Division of the New York Supreme Court in the case of *Wrighter v. A. A. Adams Stores, Inc.*, 250 N. Y. Supp. 98. Referring to the Second Class Cities Law, the Court said:

"Section 244 provides that no civil action shall be maintained against a city for damages for injuries to persons sustained in consequence of any sidewalk being dangerous or obstructed, unless it appears that a written notice of the dangerous or obstructed condition of such sidewalk was actually given to the commissioner of public works. Notice to a city of a dangerous condition in a street, where the city has granted a permit to place the obstruction therein and its authorized agent has inspected it, is not a condition precedent to a right to bring an action for damages by the obstruction. . . . Where a city grants a permit to obstruct a sidewalk, it is under a continuing duty of inspection until the obstruction is removed; it is entitled to no further notice of the condition due to that obstruction."

Improvement Contracts

Contract for construction of incinerator was voted where lack of specifications precluded competitive bidding.

A city auditor rightfully refused to countersign a contract to install an incinerator, because the Dallas City Commissioners had awarded the contract on bids that left it to the several bidders to submit their own specifications, decided the Texas Court of Civil Appeal in *Superior Incinerator Co. of Texas v. Tompkins*, 37 S. W. 2d, 391.

Referring to a controlling provision of the Dallas charter, the Court said:

"For the purpose of safeguarding the interest of taxpayers, upon whom must fall the burdens of government, said charter provisions require that all contracts for public improvements, costing as much as $500, must be awarded . . . upon competitive bids based upon specifications. . . .

"There was no chance for competitive bidding, as no two prospective contractors were required to bid or would bid upon the same character of improvement, as determined by the plans and specifications therefor, this for the want of definite specifications upon which to bid. . . .

"A competitive bidding statute is fundamentally violated where the bidder is asked to furnish plans and specifications, and an award made under such circumstances is void. . . .

"Conceding that the scheme for the construction of said plant contemplated the use of a patented process, said Board of Commissioners had full authority to secure the privilege of using same before proceeding with any of the material preliminary steps required by the charter provisions of said city to be observed in order to complete for it a binding contract. This course was not adopted."

Street Vacation

Owner held not entitled to damages for closing of portions of streets on which his property did not abut.

A city established a playground on four blocks of ground, vacating the portions of streets that had bisected the area. In *City of Lynchburg v. Peters*, 157 S. E. 769, the Virginia Supreme Court of Appeals decided that an owner of hospital property nearby, but not abutting upon the portions of streets closed, had no right to a damage award. Said the Court:

"Dr. Peters is not an abutting landholder and has none of those special rights which such landholders sometimes have in the streets which adjoin their property. He is not entitled to damages in that capacity, and he is not entitled to damages for inconveniences shared with the general public and which differ in degree only and not in kind."

Municipal Contracts

A city may authorize an agreement by an oral motion, in the absence of charter or statutory requirement for an ordinance or resolution.

Sustaining the validity of the employment by a city of an engineer for a proposed sewer system, under an oral motion adopted by the Council, the St. Louis Court of Appeals said in *Haskins v. City of De Soto*, 35 S. W. 24, 964:

"Now it will not do to say . . . that a municipal corporation can act only through an ordinance, for the general law is quite to the contrary. Of course, in the large majority of instances the statutes do require the formality of an ordinance to warrant a city in exercising the power conferred upon it; and, where the statute so provides, there is no doubt that an ordinance authorizing it is a necessary condition precedent to the making of a valid and enforceable municipal contract. . . . However, the authorities hold that, in the absence of such statutory requirements, that is, when the mode of contracting is not prescribed by statute or charter, as the case may be, no ordinance or resolution is necessary to the making of the contract, nor is it even essential that it be in writing."

Municipal Nuisances

City held liable for nuisance in emptying sanitary sewers in creek; measure of damage stated.

In *City of Madisonville v. Nisbit*, 39 S. W. 2d, 690, the Kentucky Court of Appeals upheld judgment against the city for damages resulting to a landowner through pollution of a creek in the discharge of sanitary sewage. As to the measure of damages recoverable against municipalities for maintaining nuisances, the Court is reported to have said:

"If the nuisance is permanent, the measure of damages is the depreciation in the market value of the property. If the nuisance is temporary, and capable of correction at reasonable cost, the measure of damages where the property is occupied by the owner is the diminution in the value of its use during the continuance of nuisance. If the property is not occupied by the owner, the measure of compensation is the depreciation in the rental value during the continuation of the wrong."

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Street Trees Through Civic Cooperation

DECATUR, ILL.—In the spring of 1931 a tree-planting program was sponsored and financed by the Young Men's Division of the Association of Commerce to reestablish boulevard trees in Decatur.

Like many other cities, Decatur unfortunately has a great many poplar trees in the boulevards, planted by owners of newly established subdivisions. Individual property owners planted some for quick shade and others just because they wanted trees and the poplar tree was an inexpensive type. Many of these trees have passed their short period of usefulness, and are being removed at the rate of about 400 every year.

The tree-planting program as outlined calls for 30,000 trees, 10,000 tree seedlings to be planted each year for three years at a cost of approximately $100 a year. Those already planted are 4,000 elm trees, 3,000 sycamores and 3,000 tulip trees. Four members each of ten Boy Scout Troops were selected to plant and care for the trees. Permission was given for the use of reserve land owned by the Decatur Park District as a nursery. The Park Superintendent assisted in selecting, purchasing and supervising planting.

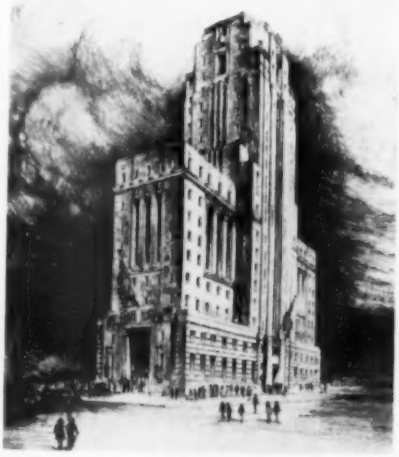
Future plans provide for the actual replanting of trees in Decatur streets at no cost or inconvenience to the property owner.

J. A. FRAZIER,
Superintendent, Decatur Park District.

Berks County Achieves a Brilliant Building Program

READING, PA.—The program of public improvement now current or already completed in Berks County is of such character as to give national prominence to the county, and of such scope as to go far in stabilizing employment and restoring business to its normal state. The program, incidentally, stands as a monument to the progressiveness of city and county officials and to the generosity of certain prominent citizens.

The improvements, either already completed or well on the way to completion, include a $2,000,000 courthouse, a $750,000 county prison, a $400,000 county tuberculosis hospital, and a $500,000 bridge. The courthouse, for which Wm. H. Dechant and Sons were the architects, is almost finished. It is a 19-story structure planned in conformity with best present-day practice as to exterior and interior design, and as to the materials used. It is of fireproof steel and concrete construction. We believe that this building holds a place of distinction among the country's skyscrapers designed for county headquarters purposes.



THE COURT HOUSE

The prison, from the standpoint of efficiency and appearance, is second to none. It is also modern in conception, but is strongly marked by collegiate Gothic influence. As shown in the illustration, its appearance is that of a group of trade school buildings, with dormitories and a chapel. The architect was Alfred Hopkins, an associate of William B. Broadhurst, of New York. Its site is a part of the 600-acre farm tract donated to Berks County by William W. Essick. On this tract also the new county tuberculosis hospital will rise. Alexander F. Smith is the architect for this building.

The new bridge at Buttonwood Street is the fourth large modern span across the Schuylkill within the city limits of Reading. William F. Mueser, of New York City, is the architect. All these bridges are exceptionally modern in design, and are of a width to carry maximum capacity of six lines of traffic. Two prominent citizens, Ferdinand Thun and Henry K. Janssen, made the new bridge possible by contributing $225,000 for its construction. The county is investing $200,000, and the city of Reading is making a present contribution of $30,000 to the total cost.

The Present County Commissioners of Berks County who consummated the above program are Walter A. Ringler, Francis K. Savage, and John H. Blimline.

HENRY E. BODINE,
Secretary-Manager, Chamber of Commerce.

Controlling Sight Obstruction at Intersections

WHEATON, ILL.—Following is Wheaton's ordinance for the control of hedges and shrubbery on corners in residence districts. The Chief of Police has

A GENERAL VIEW OF THE PRISON GROUP

A HALF-MILLION-DOLLAR GIFT TO GRAND RAPIDS

written his notice on the back of one of these copies and passed it to the owner of every obstruction which violated the ordinance, with the result that we now have no such obstructions.

"SECTION 1.—No hedge, shrubbery, wall, fence or other similar obstruction shall be maintained or permitted within a radius of 30 feet from the outside corners of any street intersection in said city, to a greater height than 4 feet above the level of the center of the adjoining streets.

"SECTION 2.—It shall be the duty of the chief of police to cause a notice to be served upon the owners or occupants of all property where violations of this ordinance hereafter exist, to remove such obstructions within one week from the service of such notice.

"SECTION 3.—The owner or occupant of any property who shall fail to remove any such obstruction within one week after the service of such notice shall be deemed guilty of a misdemeanor, and shall be punishable by a fine of not less than $5 nor more than $25. A separate offense shall be deemed to have been committed on every day that such obstruction is permitted to remain after the expiration of said period, one week after the service of such notice.

"SECTION 4.—Any and all ordinances in conflict with this ordinance are hereby repealed.

"SECTION 5.—This ordinance shall be in full force and effect from and after its passage, publication and the lapse of time provided by law."

W. H. CALDWELL,
Mayor.

Trees for the Old Spanish Trail

HOUSTON, TEXAS.—A movement has been started in Texas for the planting of trees along the Old Spanish Trail from San Antonio to the San Jacinto battleground near Houston, a distance of more than 200 miles.

The Texas Highway Commission has approved the project and has promised to preserve and maintain the trees. The planting of the trees will be possible through the various civic and patriotic organizations in the several counties traversed by this section of the Old Spanish Trail, and will be done under the supervision of the Highway Department, as a memorial to veterans of the Texas war for independence and later wars.

Guadalupe County has already made a proposal to plant pecan trees along its portion of the highway. The Highway Commission has accepted the proposal of this county, hoping others will follow.

The Old Spanish Trail, in passing through Houston and San Antonio, links two of the great historical events in the colorful history of Texas. The battle of the Alamo, in which every man within its walls was killed, including such noted characters as David Crockett and Jim Bowie, the duelist, was fought at San Antonio. The independence of Texas was won at San Jacinto, when General Sam Houston charged across its slopes with his men, crying "Remember the Alamo."

The Alamo still stands at San Antonio and is the state's greatest shrine. The San Jacinto battleground is now a state park.

MALCOLM YATES,
Chamber of Commerce.

Half-Million-Dollar Gift to City Also Aids Unemployed

BATTLE CREEK, MICH.—In order to provide new employment in this section through the coming winter, W. K. Kellogg, chairman of the board of the Kellogg Company, cereal manufacturers, has authorized immediate construction of an imposing civic auditorium, his latest gift to this city.

When completed, this structure, on which more than 300 men will be employed, will bring to this great health center facilities that will place it in the front rank of the convention cities of Michigan and the Middle West. The building, classic in design, will cost a half-million dollars. Detailed specifications are being worked out by the architects, Albert Kahn, Inc., of Detroit, and contracts will be let as quickly as possible.

Mr. Kellogg, in announcing the project, stated that he had been contemplating the gift of such an auditorium to the city for several years. "I had thought the gift might not be made until next year, but construction undertaken this fall affords opportunity to relieve in some measure unemployment conditions," he said.

The plans of the building combine with the auditorium another community need, a new junior high school. The central portion of the structure, which will house the auditorium, will be approximately six stories in height, and the twenty-six classrooms of the junior high school will be in the three-story wings. The gift is being made outright to the Battle Creek Board of Education with the understanding that the auditorium will be available at all times for civic uses.

RUDOLPH H. HABERMANN,
Secretary, Chamber of Commerce.

A Michigan City Looks to Its Traffic Control

ESCANABA, MICH.—Traffic ordinances adopted in 1920, and even as late as 1926, are hopelessly inadequate to meet the traffic problems of today.

I consequently appointed a Citizens Committee, composed of prominent business men conversant with the local situation, to study the existing regulations, and to recommend satisfactory changes. They made the following recommendations to the City Commission:

First, that all U-turns be abolished on Ludington Street, which is our principal business street;

Second, that one-hour parking between 7:00 A. M. and 6:00 P. M. be instituted on Ludington Street;

Third, that several new "Stop" streets be created throughout the city, and that several "Stop" streets at present in use be abolished and made "Slow" streets;

Fourth, that the angle parking in vogue on Ludington Street and the streets adjacent to Ludington Street be continued, but that the angle be considerably increased in order to accommodate more vehicles;

Fifth, that the speed limits in the business district be increased to 20 miles per hour and in the residential section of the city to 25 miles per hour.

These recommendations, made by the Citizens Committee, were presented to the City Commission and immediately enacted into municipal law. I believe that making the citizens responsible for their own government is the true spirit of the city manager form of government, which has been in force in this city since 1922.

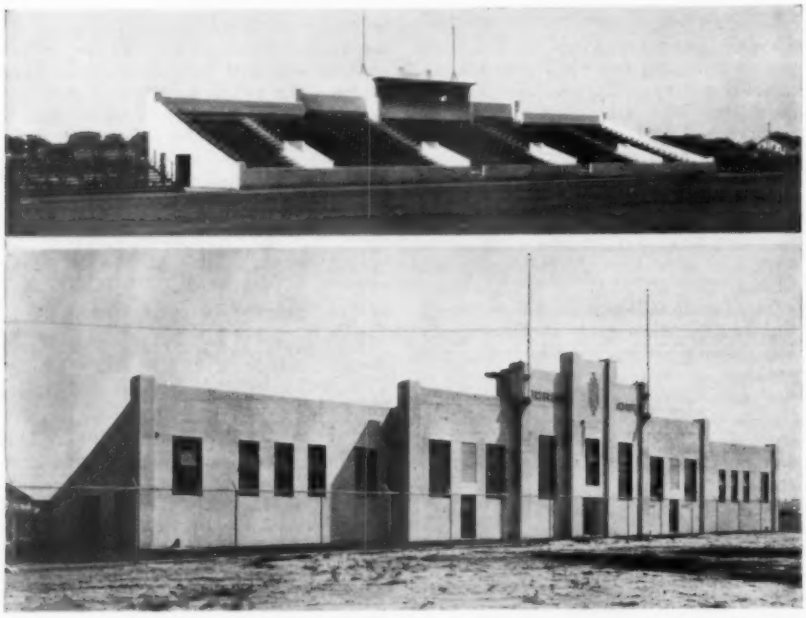
W. H. NEEDHAM,
Mayor.

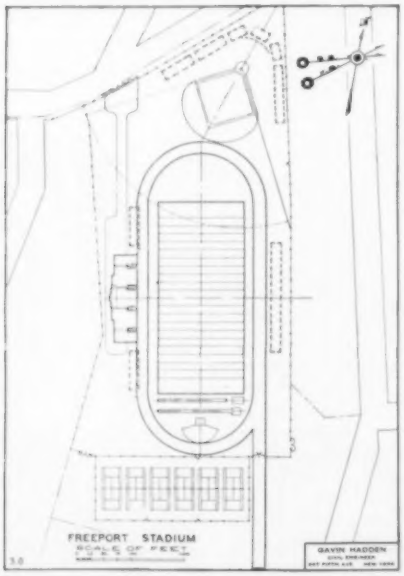
Freeport's Athletic Fields and Stadium

FREEPORT, N. Y.—Although the village of Freeport formally dedicated its new athletic field and concrete stadium on October 3, 1931, I can say with certainty that when the village Board of Trustees decided in 1929 to purchase a certain 26-acre tract of salt-marsh meadow land (through which tract it was necessary to carry the force-main connecting our sewerage system with the disposal plant, no one on the Board had the faintest idea that Freeport would possess in 1931 an ideal athletic field with a concrete stadium erected upon it.

When the Board decided to purchase the 26-acre tract, most of which was useless except as affording a place upon which the village might dump ashes collected from householders, we were of the opinion that our action was the only way out of a bad situation. In order that the sewer system might work, it was necessary that the plan of the engineers be carried out, and we could not agree with the owners of the tract upon a price for an easement.

Once the problem placed before us by the Sewer Commission had been disposed of, we began to wonder what could be done with the upland portion of the 26-acre tract. We knew that the Board of Education had been unable to procure a tract of land suitable in area upon which to lay out an athletic field. With this fact in mind, and knowing that we had land for which there was no immediate use, we got the two boards together—with the result that Freeport now has its beautiful stadium and athletic field, of both of which the village feels justly proud.





THE FREEPORT STADIUM

The plan (left) shows the relation of the building to the field and the various play areas

The work was designed by Gavin Hadden, civil engineer, of New York City, who has planned numerous athletic fields and athletic buildings for other municipalities, and for colleges, schools, country clubs, etc. The stadium was built by S. S. Thompson & Co., Inc., of Red Bank, N. J., and the fields by Tully & DiNapoli, Inc., of Long Island City, N. Y., both under the direct supervision of Baldwin & Cornelius Co., Inc., Village Engineers at Freeport.

The stadium, shown in the accompanying photographs, is of reinforced concrete and has a seating capacity of 2,027 spectators. It has several particularly commendable features, one of which, the press stand, is quite unusual in a stadium of this size. A cantilevered roof, protected sides, a desk with shelves, a permanent bench, adequate lighting and a telephone outlet contribute to the comfort and efficiency of newspaper men reporting the games.

All the space underneath the seating deck is used to great advantage. Here are found two suites of rooms for players, each consisting of locker room, shower room, toilet room and toweling room. Between these two suites is a director's office. All these rooms are heated for use in cold weather. At either end of the stadium, also underneath the seating deck, are the spectators' rest rooms. Entrance to the field from the team rooms is provided through the two central portals. The stadium is carried out in the modern style of architecture, accentuating vertical lines with simple but effective ornament, and is capable of being extended to provide greater seating capacities as conditions warrant.

While the stadium is the most imposing part of the project, the playing fields are no less useful from a recreational standpoint. The football field immediately in front of the stadium is surrounded by a quarter-mile cinder track of exceptional resiliency. Inside this track there are high jump, broad jump and pole vault pits. Outside this is the baseball infield with its "skinned" diamond. All these facilities were laid out with the greatest care to insure minimum hindrance to the players from the sun's rays. Careful study was made of the various drainage problems and that these were intelligently met is attested by the fact that all the fields and the stadium seating deck were devoid of standing water but a few minutes after one of the most intense rainstorms experienced in Freeport in years. In addition, six clay tennis courts are provided, and these will undoubtedly be among the most popular of the playing facilities.

Supplementing these permanent facilities, there are 2,000 temporary seats. These seats are really sectional grandstands arranged so that by breaking them into sections they are equally useful as baseball spectators' seats or as additional seats for football and track games, bringing the total available seats for football to something over four thousand.

A statement of the cost of this project will be of interest. Below is given a table of the actual construction cost of the various parts of the work exclusive of the cost of the rough grading by hydraulic fill.

Playfields, track and tennis courts, including drainage	$17,800
Stadium	46,800
Fencing	4,700
Equipment	2,400
Temporary stands	6,000
Total construction cost	$77,700

We have here an example of a progressive and energetic community carrying out an efficient and economical municipal improvement by providing itself with the best of facilities for spectators and players for a number of popular sports, and at the same time reclaiming a large plot of land for which there was little if any use.

JOHN F. DE LORME,
Trustee, Village of Freeport.

Philadelphia's New Auditorium

PHILADELPHIA, PA.—Civic pride always rates high in Phliadelphia, and the citizens of our city find a full measure of justifiable satisfaction in the completion of their $5,350,000 Municipal Auditorium, recently dedicated to the world of thought, instruction and amusement.

The city of Philadelphia presents to the nation this magnificent structure as an ideal place for the holding of great conventions of political, scientific and educational organizations, and for musical, theatrical and athletic attractions. The dedication ceremonies were held on September 17 last, and the attendance tested the capacity of the auditorium. The Municipal Bureau of Music, one of our fixed municipal activities, provided a splendid concert program. There was a chorus of 1,000 voices, young men and young women, with Dr. Henry Gordon Thunder, world-renowned organist, as conductor. The soloists included Mme. Bianca Saroya, dramatic soprano and prima donna of the Philadelphia Opera Company, and Nelson Eddy, well-known baritone. A $60,000 organ is one of the striking features of the building.

The great audience was enthralled by the harmony of color lighting effects when the auditorium was thrown into darkness and instantly the prismatic colors bathed the interior. The electricians, like unseen magicians, translated the deep-blue hues of night, with myriad twinkling stars, into the rosy glow of dawn, swiftly sliding the effect to dazzling sunset. The mysterious changes from light to shadow through the prismatic scale seemed to emanate from the walls, the balconies and the glass-domed roof.

Set in the center of what is destined to be the finest section of the Philadelphia of the future, the Municipal Auditorium is surrounded by improvements being pushed to completion by the city and the Pennsylvania and the Baltimore & Ohio Railroads. Close by the Schuylkill River, which is being beautified with garden-framed drives on both sides and marble and granite retaining walls, the Auditorium will stand as a sparkling gem of architecture in a setting of magnificent new stations, bridges and river improvements costing $100,000,000. These works will be completed in the next few years.

The building is located at Thirty-fourth Street and Vintage Avenue, in the West Philadelphia section. It is 406 feet deep and 336 feet wide and has a seating capacity of approximately 15,000. It contains 21 rooms for meeting purposes, besides the auditorium, a magnificent ballroom on the second floor, an exposition hall beneath the auditorium affording 80,000 square feet of exhibit space, and a large dining-hall with modern kitchen equipment. The auditorium is so constructed that there is neither pillar nor post to obstruct the view of the great stage from any point.

HARRY A. MACKEY,
Mayor.

THE AUDITORIUM—EXTERIOR AND INTERIOR

The building has been placed in a carefully considered and unusually desirable location. The interior views are of the big ballroom and the auditorium

Catching the Criminal by Police Radio

By ROSCOE KENT
De Forest Radio Company, Passaic, N. J.

CRIME prevention is one of the paramount issues of today. Crime as practiced is organized violence adequately financed and directed by men of brains who, were their energies devoted to honorable pursuits, would give many a directing executive of our large corporations a real race as to organization and managing ability.

The modern criminal has at his disposal swift modern methods—trains, autos, airplanes, and hired gun men. To combat such organized violence, the majority of the citizens of this country are furnishing nothing but destructive criticism, primarily due to lack of knowledge of the situation as a whole.

To assist in the apprehension of the criminal while the crime is being, or about to be, committed is to help to rid your community of organized crime. Where there is no police radio, the criminal goes over his route of attack and route of escape to determine the minimum of time in which the police can reach the scene, and he saves enough of those minutes in which to make his successful get-away. Usually he leaves a cold trail, often obliterated by the victim, so that it takes hours for the police to get a connected story on which to work. And perhaps, the victim who can describe the criminal and recognize his picture declines to be "sure" when the moment of actual identification confronts him.

The art of radio science applied to police work is one of the best methods known for quick apprehension of criminals, and for regaining stolen property and preserving human life.

Definite Results

A bank was robbed in Michigan, a state trooper killed. In two hours the criminals were captured, with the whole amount of loot as well as the stolen car they used, and since that date—October 14, 1930—no major hold-ups have occurred in the state of Michigan. One apprehension has prevented crime for a year.

You have parked your car on the street and gone into a store or office to transact your business, and when you come out, your car is missing. You report it to police headquarters, the description and number are broadcast, and in a short while—in many cases only a few minutes—your car is recovered. The stealing of cars is reduced to a minimum in a police radio equipped community.

According to the *Los Angeles Examiner*, the Radio Police Division of Los Angeles nabbed 66 more suspects in May, the first month of radio operation, than the entire force seized in April—and faster: "In April uniformed men made 559 arrests, of which 41 were for felonies; in May the officers manning the 43 police radio cars made 625 arrests, of which 178 were for major crimes. During April 177 robberies were reported; in May, with radio equipped cars cruising the streets day and night, robbery figures dropped to 133."

Instant Notification

The reason for this quick apprehension with the aid of radio is clear—the great time gap heretofore permitted a criminal is closed.

Almost every crime is witnessed by some one—the victim, or a bystander; or perhaps a burglar alarm automatically notifies headquarters. In nearly all cases headquarters knows of the crime immediately upon its taking place. In the past, as now, men in headquarters could go out at once—but the scene of the crime might be far away. Precinct stations had to be notified by telephone. The chase was delayed until patrolmen in cars and motorcycles or on foot came to the precinct stations, or telephoned, and were notified of the crime.

By means of police radio, headquarters can broadcast information instantly to every precinct station and every police auto. Orders can be given to descend upon the scene of the crime from various directions by police cars. The net is quickly formed and tightened. Often the criminal is caught at the scene of the crime; usually not far away. If he should get outside the net, the chase may be taken up and directed by radio. Descriptions of the criminal and the car are broadcast. Any one who sees the car telephones headquarters, and this information is relayed to the pursuing cars.

The Desk Sergeant at the Microphone

The operation of a police radio is simple and efficient. The transmitter, at headquarters, is of sufficient strength to cover the required territory, be it a city, a county, or an entire state. A microphone is on the desk sergeant's desk. The vacuum tubes of the transmitter are kept at half-glow so that a message may be broadcast immediately upon its arrival at headquarters. In the precinct stations and police cars there are radio receivers, tuned to and locked on the wave length used by the transmitter, which is on the low wave band, outside the range of the usual home broadcast receiver; thus the police messages are received only by the police, not by all owners of radio receivers. Every ten or fifteen minutes test signals are broadcast, on such routine matters as missing persons and stolen cars.

As soon as the desk sergeant gets word of a crime, over the telephone, he speaks into the microphone, and every police car is immediately on the job; in fact, he may broadcast descriptions, and directions for the capture, while the message is coming in over the telephone. Thus that vital half-hour, formerly allowed the criminal because headquarters could not get into direct touch with those in a position to give chase, has been almost eliminated. The police are no longer handicapped by a cold trail, nor the district attorney by lack of evidence. Criminals steer clear of communities protected by radio. With its use the apprehension of criminals averages about 3½ minutes.

Securing Police Radio for a Community

It is not necessary for a community figuring on radio to apply for a construction permit from the Federal Radio Commission the first thing, as the Commission recognizes the utility of police radio and in many cases it does not take more than a week to ten days to obtain the license, and no hearing is required, providing the community applies for a license of a power within reason. Although certain powers are specified in the Commission's General Order No. 85, by population, this order has been made flexible to give adequate coverage for police protection, the only stipulation being that at no time shall any one unit have a rating greater than 1,000 watts daytime and 500 watts nighttime, as it has been found advisable to have a number of stations to clear the traffic rather than one large station blanketing the entire area. This not only gives better service, but centralizes the control and dispatching within smaller areas somewhat similar to the precinct set-up in police departments.

To cities that are contemplating the use of police radio I suggest that they have a field strength survey made to determine the powers required and the proper location of the transmitter, and that general specifications be drawn up, not specifying any one item, but simply stating that the transmitter must be within the frequencies assigned by the Federal Radio Commission and that it must conform with the Commission's General Order No. 115 as to power rating, and to General Order No. 119 as to frequency stability; also that the contractor is to take care of filling out the necessary papers for obtaining a frequency and a license from the Commission, as reputable contractors in this field maintain men in Washington especially to attend to this. By using this skeleton form of specification, the city will receive the specifications in toto of the set manufactured, which specifications have been approved by the Commission, and the purchasing department of the city can, through its technical branch, select the one which best suits the city's needs and appropriation.

THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance, Conducted by A. E. BUCK, National Institute of Public Administration, New York

Striking Analysis of Detroit's Debt Cost

THE Detroit Bureau of Governmental Research has recently published a striking analysis of the ultimate cost of that city's debt. It would be most interesting if we had similar analyses of the accumulated future costs on the existing debts of New York, Chicago, Philadelphia, and some of the other large cities of the country.

The Bureau finds that the total charges to be met within the next 30 years on all bonds of the city of Detroit outstanding on September 1, 1931, will be $278,130,458 for principal and $238,664,159 for interest, a total of $516,794,617. Of this amount, over half must be paid during this and the next eight years. During 1933 the present debt requirement will reach a maximum of slightly over $34,300,000, of which $18,500,000 will be for principal and $15,800,000 for interest. From that time on, these requirements will gradually decrease each year, going below $20,000,000 in 1944 and below $10,000,000 in 1954. The Bureau presents a table giving each year's requirements for both principal and interest until the final extinguishment of the present indebtedness in 1961. The totals include self-supporting utility bonds as well as the indebtedness which must be paid directly from taxes. The latter amounts to $368,292,762, according to the Bureau's calculations. The remainder will be met from street-car fares and water rates.

In a brief historical sketch of Detroit's borrowing, the Bureau points out that the city began issuing bonds in 1835, when $50,000 of bonds were sold for acquiring water works, streets and sewers. A similar amount was sold the next year. By 1920 the city had a net debt of $26,000,000 and a tax budget of $25,000,000. Today its tax budget amounts to $76,000,000, and its net debt is in excess of $300,000,000.

This financial situation, says the Bureau, has resulted from a policy which has largely ignored pay-as-you-go in acquiring public improvements. The tax rate has been temporarily kept down by issuing bonds, some of the proceeds of which were expended for improvements of a trivial character. As things now stand, largely because of the injudicious use of the borrowing power in the past, new undertakings of a capital nature have been practically discontinued.

This is something for the responsible authorities, not only of Detroit but of other cities in the United States, to think about. Especially is this so when the general economic and industrial conditions of the country are such as they are at the present time. "A dollar borrowed," warns the Detroit Bureau, "means from a dollar and a half to a dollar and seventy-five cents to be returned—principal plus interest—for the privilege of deferred payments."

New York City's Assessment Roll Boosted

THE tentative assessment of land, buildings, and personal property in New York City, as recently announced by the Department of Taxes and Assessments, is placed for 1932 at $20,718,430,261, an increase over the current year of $1,117,166,654. At the same time, property worth $5,375,558,670 is on the exempt list.

While admitting that the increase seemed excessive, the Department of Taxes and Assessments said that $437,000,000 of it was due to the completion of new buildings during the year, including many skyscrapers; and that there was also the substantial item of nearly $800,000,000 of housing on which the temporary tax-exemption had expired.

The tentative character of the roll did not deter the city budget director from taking advantage of the opportunity to state that he thought the taxpayers might expect an 8-point tax reduction on the basis of the new assessment figures. Whereupon City Comptroller Charles W. Berry said that it was rather absurd to attempt to predict the tax rate with so many uncertain factors yet to be adjusted.

The tentative assessment roll has been severely criticized both by private associations and by the city press. Peter Grimm, President of the New York Real Estate Board, said, "It is impossible to understand how the valuation of two years ago could be maintained while on every hand prices and valuations are dropping." He predicted concerted action on the part of realty interests and taxpayers to have the assessments reduced. The *New York Herald Tribune* attacked the assessment figures in an editorial entitled, "Putting the Rabbit in the Hat," which ran as follows:

"The discovery that assessed real property valuations in the city have risen by $1,117,000,000 in a year of exceptional storm and stress for realty values might seem a startling indication of fundamental prosperity. Unhappily, it will not seem so either to the property owners or to those who understand the tactful legerdemain of municipal finance. Whether you keep the tax rate down or boost the assessed valuations upon which it is levied may come to much the same thing in the end, but among the financial wizards of city government the former is always regarded as much the more artistic effect. The tax rate is the rabbit which they pull triumphantly out of the hat; the trouble is that even the best magicians cannot get a rabbit out of a hat until they have first inserted him into it. What we are now witnessing is the annual preparatory business of putting the animal into the topper.

"It remains to be seen, however, whether he will go in without a struggle, and Comptroller Berry, at least, is willing to make no predictions as to the ultimate success of the demonstration. In the good old days, assessed valuations were expected to maintain a normal increase of about $800,000,000 a year, and for 1932 there was the $1,000,000,000 windfall of tax-exempts to be anticipated. Now that we have the windfall, however, it is tentatively assessed at less than $800,000,000. Some believe that $500,000,000 would be nearer the proper figure. New building and improvements provide only $437,000,000. Except for some minor reductions to allow for 'a change in the character of the inhabitants' in certain sections, the existing values are simply kept where they were in order to achieve the total valuation of $19,000,000,000.

"How well will it stand in the face of the fact that the sales value of properties has everywhere suffered a steep drop? There are certain to be many protests on the tentative figures, and if the Board of Taxes and Assessments is not itself lenient in writing them down, there will be the prospect of court actions. The tax rate is evidently still on the knees, if not of the gods, at least of the final figures.

"The adjustment of the real property assessments this year promises to be a serious business. But while wrestling with it the citizens can find their comedy relief in the annual procession to 'swear off' the personal property assessments—those stock absurdities in our financial system."

Quarterly Tax Collections Proposed for Cities

THE collection of property taxes, particularly in the larger cities, is becoming more and more a problem—and a very serious one at that. This is especially the case in Chicago, Detroit and Cleveland. Borrowing for short periods is the usual expedient in such situations. This has its dangers, some of them rather grave.

George Wanders, writing in the *New York Herald Tribune*, explains the proposal of certain investment bankers with reference to the collection of city taxes, as follows:

"Two steps are suggested by investment bankers to overcome such troubles and prevent any depressing effects on the bonds of the communities. The first consists of a spreading of the tax payments over the entire year, bills to be sent out at least quarterly for the due proportion of the annual payments, and perhaps even monthly. That this is feasible is illustrated by the income tax payments methods of the United States Government, provision being made for quarterly payments where desired.

"The universal procedure of municipalities at present is to send out bills annually or semi-annually, to cover the payments due in the preceding year or half-year. Revenue of the taxing bodies thus begins to come in about a year after the related expenditures start, which in itself makes resort to short-term financing necessary. Ordinarily this method works satisfactorily, but at present the difficulties that it entails are aggravated.

"The installment principle of payments has been found good in other departments of finance, and it is contended that cities might adopt it with benefit in making tax collections. The psychological factor is considered the most important standing in the way, long usage making speedier collections difficult to adopt. It is apparent that a system of quarterly or monthly bills would be more expensive, but this would be offset in part and perhaps entirely by the lessened short-term borrowing.

"The second step suggested by bankers is the levying of property taxes more nearly at the beginning of the year, rather than toward the end as at present. This speeding up of the civic machinery would admittedly be difficult, and I there are also some features of the quarterly and

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monthly system that would prove sticklers to overcome. The bankers, however, most of whom are close students in municipal finance, believe there are no insuperable obstacles.

"Some legal questions are immediately brought up by these suggestions, as taxes are levied in accordance with due legislative provisions. In order to effect the changes, legislative ordinances would be required everywhere. Legal experts, consulted on this phase of the matter, have expressed the opinion that the necessary ordinances could probably be passed without much trouble in most places."

The Portsmouth, Va., Plan to Stimulate Taxpayers' Interest

CITY MANAGER FRANK C. HANRAHAN, of Portsmouth, Va., has an effective plan for stimulating the local taxpayers' interest in the work of the city government. He has prepared another small folder, giving "facts" about the city government, which is inserted in the envelope with the tax notice mailed to each taxpayer. The only cost attached to this folder is for the printing and the time consumed in preparing it. Mr. Hanrahan thinks it has justified itself.

The folder presents a brief discussion of the city's debt and finances, the cost of its public schools, and the work of its major functions. Two charts are included, showing the comparative costs of city functions and the growth of the school system.

"Budget Facts" About Minneapolis Again Appears

THE Board of Estimate and Taxation of Minneapolis has again issued its annual pamphlet called "Budget Facts." This pamphlet sets forth the financial status and budget allowances of the various governmental agencies within the city of Minneapolis. Through this method the financial program of the city is somewhat unified, although its budgetary procedure is quite decentralized.

The Board of Estimate and Taxation consists of the Mayor, the City Comptroller, the Chairman of the Committee on Ways and Means of the City Council, the President of the Board of Education, the President of the Board of Park Commissioners, and two elective members. George M. Link has for several years been Secretary of this Board. His staff assembles the budget estimates of both expenditures and revenues for the Board, which in turn fixes the maximum tax levies and the maximum tax rates for the various funds for which levies are made. There were 27 such funds in 1930. Then the respective governmental authorities, such as the Council, Board of Education, and Board of Park Commissioners, authorize the various levies, subject to such maxima.

A consolidated budget for the city government is as yet lacking. The Board of Estimate and Taxation, however, has established a procedure, but without charter backing, permitting the preparation of a statement that may be presented as the tax budget of the city. The Board specifies maximum expenditure allowance for all funds for financing the current operating activities of the city government. These are certified to the City Comptroller and become the basis of his control accounts. Expenditures for retirement and debt purposes depend on actual tax collections and debt requirements, for which estimates only are made by the Board, but for which maximum expenditure allowances are not fixed.

Why Massachusetts Cities Are Constantly Borrowing

THE New Bedford Taxpayers' Association devotes one of its recent bulletins to the question of why Massachusetts cities are constantly borrowing money to meet their current expenses. The reason assigned is that the fiscal year begins December 1 and the taxes for that year are not due until the following October. The tax calendar is as follows: fiscal year begins December 1; city budget fixed, between January 1 and April 1; assessments of property valuation, April 1; tax rate fixed, last of August or first of September; tax bills mailed during September; taxes due October 15; taxes delinquent (6 per cent interest) after November 1; interest increased to 8 per cent on amounts over $200 delinquent after January 15; advertisement and sale of property the following September.

This accounts for the fact, says the Association, that the cities of Massachusetts have to do so much temporary borrowing to meet their current expenses. Every city is "broke" in the sense that it is without cash when it begins the fiscal year and it stays "broke" during most of the year. The Association suggests that several other states have arranged for the assessment to take place before the beginning of the fiscal year and tax collection to start on the first day of the fiscal year. In these states, cities do not have to borrow for their operating expenses, and the taxpayers therefore do not have to pay the interest incident to such borrowing. But this plan would require legal changes readjusting the tax calendar in Massachusetts, which the Association hesitates to propose.

Philadelphia's Finances

THE net bonded debt of Philadelphia, as of August 25, is $470,384,320.90, according to the city's Bureau of Municipal Research. No detailed figures are given.

The Municipal Bond Market

By SANDERS SHANKS, JR.
Editor, *The Bond Buyer*

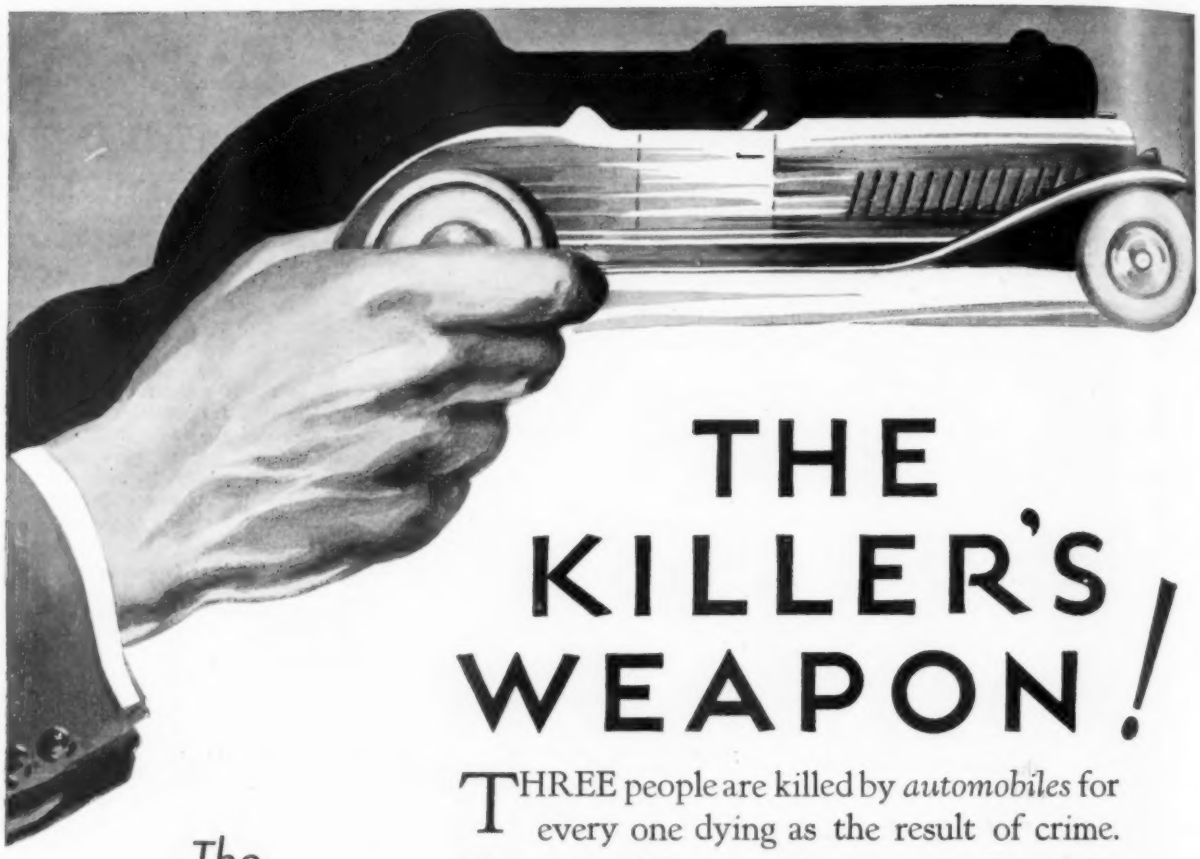
FINANCING of new state and municipal bond issues came almost to a complete standstill following the world-wide financial crisis precipitated by England's abandonment of the gold standard. The municipal bond market, until recently a beneficiary rather than a victim of the depression, early in October suffered the most abrupt and severe price decline in many years. Bonds of good grade, following the trend of U. S. Government issues, lost in a few weeks' time from five to eight or nine points, according to maturity. During this sudden readjustment, trading was demoralized and for several days there was almost a complete absence of bids for many bonds of unquestioned intrinsic value.

With world-wide monetary readjustments in the making and with our own Federal Reserve authorities indicating clearly a reversal of policy which marks the termination of the period of extreme low money rates, buyers of municipal bonds who are ordinarily the main support of the market either ceased buying or went further and became sellers of bonds. By the middle of the month, there were indications that the market for the better-grade bonds, which in mid-September were selling on a 3½ per cent basis, was settling down on about a 4¼ per cent basis. This followed the two advances in the re-discount rate which moved the rate from 1½ per cent to 3½ per cent within a week's time.

The uncertainty concerning the entire business and financial outlook is so great that no one is venturing to predict what is going to happen to bond values. It is clear, however, that there is a great deal of state and municipal borrowing which must be taken care of during coming months if municipalities are to meet the abnormal demands growing out of the unemployment crisis. While from the standpoint of the interest cost on new borrowings the outlook is not favorable, it is felt that once bond values find a stable level there will be no difficulty experienced in finding ample investment capital to absorb them.

The following representative list of sales of state and municipal issues indicates the current level of municipal bond prices:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$50,000	Beverly, Mass.	3½	1-5-yr. (ser.)	3.49
5,000	Shawangunk, N. Y.	4½	5½-yr. (avg.)	3.69
50,000	Marion, Ind.	4	5¼-yr. (avg.)	3.79
155,000	Meriden, Conn.	4	4¾-yr. (avg.)	3.85
65,000	Vanderburgh Co., Ind.	4	11¾-yr. (avg.)	3.99
500,000	Long Beach, Calif.	4 & 5	23¾-yr. (avg.)	4.35
79,500	Fairbury, Nebr.	4½	5-20-yr. (opt.)	4.61
500,000	Chicago, Ill., South Park Dist.	4	1-20-yr. (ser.)	4.64
65,481	Canton, Ohio	5	6-yr. (avg.)	4.90
15,000	Fairmont, Minn.	5	3-17-yr. (ser.)	4.93
298,000	Flint, Mich.	5½	5½-yr. (avg.)	5.72
39,500	Burlington, Colo.	6	16-yr.	6.41



THE KILLER'S WEAPON!

THREE people are killed by *automobiles* for every one dying as the result of crime. The automobile—not the gun—really is the killer's weapon of today.

Yet scores of communities war successfully on criminals and gunmen but do little to combat the rising death-toll of traffic.

How well is *your* community safeguarded—by motorcycle police—against reckless driving, speeding, and the other traffic dangers?

Remember that the cities with the best records in accident prevention employ squads of motorcycle police — most of them riding Harley-Davidson Motorcycles. Enough said!

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The Police Motorcycle

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Private Covenants—Parks—Residential Use

MISSOURI.—*Rombauer v. Compton Heights Christian Church*, 40 S. W. 2d, 545.—Where parties entering into a restrictive agreement contracted to improve and maintain a public thoroughfare and park strip at private expense, the fact that the city thereafter took over the maintenance of the park strip did not constitute a forfeiture.

The erection of a church is a violation of covenants restricting the use of lots to residential purposes.

Private Covenant—Dedication

NEW HAMPSHIRE.—*Mason v. Nashua*, 155 Atl. 681.—A condition forbidding, on penalty of forfeiture to grantor, the erection of buildings beyond a designated building line is not a dedication to public use.

Pending Ordinance

NEW JERSEY.—*Holdsworth v. Hague*, 155 Atl. 892.—Mandamus. The application for the permit was in due form, and no present legal objection exists to the construction of the building. The city, however, is making a survey with a view to the adoption of a zoning ordinance which might prohibit the construction of the projected building. Such an ordinance has been proposed, and numerous hearings upon it have been held. The city claims that it should be given the necessary time to adopt a satisfactory ordinance.

Held, that the peremptory writ should be awarded. While it is true that municipalities are entitled to a reasonable time after the adoption of the constitutional amendment authorizing zoning legislation, and the passage of the zoning act in 1928 in this state, in which to act, the reasonable time so accorded has expired in this case. *Deerfield Realty Co. v. Hague*, ib. p. 893, in accord.

Esthetics—Eminent Domain

NEW YORK.—*Board of Supervisors of Herkimer County v. Beardslee*, 252 N. Y. S. 10.—Injury to the scenic aspects of a country estate by the construction of an embankment thereover should be considered as a possible element of damage in eminent domain proceedings.

Zoning—Variance

NEW YORK.—*Matter of Eaton v. Sweeny*, 257 N. Y. 176.—Upon an application for an alternative or peremptory order of mandamus to compel the Commissioner of Public Safety of the city of Saratoga Springs to issue a permit for the use by the petitioner of his property for a purpose not permitted by the zoning ordinance of the city, where there is no provision in the zoning ordinance for the variation of a use except upon petition of the owners of 50 per cent of a block front, and no method is prescribed for a review of the action of the City Council or of the Commissioner of Public Safety, and the petition alleges that the ordinance deprives the petitioner of all reasonable and beneficial use of his property, but the affidavits in opposition deny such allegations and say that the property may be profitably used, a question of fact is presented and an alternative order of mandamus should issue for its determination.

Aeronautics

NEW YORK.—*People v. Katz*, 140 Misc. 46.—A state law providing a penalty for flight, in certain cases, at a height of less than 1,000 feet, as applied to non-commercial flight wholly within the state, in within the power of the state and does not contravene the interstate commerce clause of the United States Constitution. The state has the right, within the scope of its recognized police power, to regulate certain phases of aviation.

NOTE BY EDITOR.—In an editorial on this case in the *New York Law Journal* for September 19, 1931, there is an exhaustive citation of cases on the various law points involved in this case.

Zoning Setbacks—Business Districts

NEW YORK.—*Town of Islip v. Summers Coal and Lumber Co., Inc.*, 257 N. Y. 167.—The zoning ordinance of the town, in so far as it requires a setback of ten feet from a given street zoned for business purposes, is not on its face unreasonable and therefore unconstitutional. A court cannot say upon mere inspection of the zoning ordinance that the end in view is not reasonably pursued by its adoption in order to lessen congestion in the streets and thereby promote the public safety. Decision below (232 App. Div. 701) reversed.

The Regional Survey of New York and Its Environs (Vol. VI, at p. 135) quoted to show that and how "a wise public policy may require the owners of new buildings in business districts under proper conditions to set their buildings back from the street in order to enable their business to function without congesting the street. *Gorieb v. Fox*, 274 U. S. 603, cited.

The correct rule to apply where "underlying questions of fact may condition the constitutionality of legislation of that character" is to uphold the presumption of constitutionality in the absence of "some factual foundation of record for overthrowing" it (*O'Gorman and Young, Inc. v. Hartford Fire Ins. Co.*, 282 U. S. 251, 257).

Setbacks—Extension of Non-Conforming Use—Boards of Appeal

NEW YORK.—*Matter of Van Auken v. Kimmey, Superintendent of Bureau of Buildings of City of Syracuse*, 141 Misc. 105, and 117.—Setbacks, as such, are not authorized by zoning enabling acts, since such lines are a taking of private property without compensation which can only be justified upon the highest grounds of public health and safety, and then only with ample opportunity for a hearing on the part of the party aggrieved. *Matter of Wulfsohn v. Burden*, 241 N. Y. 288, cited with approval; in which case it was held that a zoning setback (or front yard) for a given large apartment house of a certain distance "cannot be said to be an unreasonable protection" against dangers to health. *Gorieb v. Fox* 274 U. S. 603, also cited, and the views expressed in the present case also said "not out of harmony with the opinion in that case, when properly read."

Nor can it be said that the location of a setback line, in the zoning ordinance, by the average of the setbacks of existing buildings in a block, is dictated by any consideration of either public safety, public health or general welfare, since such a method "does not establish a general rule of distance, but rather a variable measure, having no relation to width of street or surrounding conditions; nor is the setback line anywhere established so that anyone would know where in any particular place the setback line might be; the 'setback line' in one block would vary from that in an adjoining block on the same street; nor has there been any opportunity for anyone to be heard in reference to the establishment of a setback line in any particular locality. . . . This line might be varied from time to time by the destruction of property by fire, and would change from the construction of every new building; it might be one distance one month and another distance another. So the provision of the zoning rule fails to establish a setback line. The attempts to enforce such a provision would, on its face, be unreasonable and arbitrary."

The city has not seen fit to establish a board of appeals; and while, under the facts of this case, the applicant for a permit for the extension of his non-con forming building on the same lot in the same ownership might have been entitled to the variance he seeks on recourse to such a board, he has not established facts warranting him to this relief in this action of mandamus.

The Progress of Zoning

See The Municipal Index for 1930 and 1931 for a cumulative record of zoning decisions published in The American City.

Illinois Resurfaces

63.23 MILES WITH BRICK

ILLINOIS began a brilliant chapter in highway economy this year, by widening and resurfacing worn concrete roads with brick.

A total of 63.23 miles constituted the initial program.

Thus, slabs that have not too far approached the end of their usefulness are being saved for many years to come. *Brick* pavements built 30 and 40 years ago are in constant use today, although not nearly so well constructed as these Illinois brick resurfaced sections.

The economy and sound judgment in resurfacing with brick is apparent. The worn concrete—unsatisfactory as a pavement—will make a good base on a subgrade that has received its full settlement. Mastic cushion and bituminous filled brick surface prevent transmission of cracks. Weather and traffic will have no effect on the brick surface. The existing slab has been transformed into a low-maintenance road extraordinarily well suited to all traffic.

Highway engineers, officials and taxpayers will find much of interest in this Illinois work.

Further information on resurfacing with brick may be had by addressing the National Paving Brick Association, 1245 National Press Building, Washington, D. C.

Completed brick resurfacing of worn concrete by Illinois State Highway Department on Route 4 south of Springfield. This gives the highest type highway at low cost.

Worn slab being prepared for curb and brick resurfacing.

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Photos by courtesy of Division of Highways, State of Illinois

VITRIFIED

BRICK PAVEMENTS

FACE THE FUTURE « » PAVE WITH BRICK

Residence District—Variance—Temporary Use

RHODE ISLAND.—*Morris v. Zoning Board of Review of City of Pawtucket*, 155 Atl. 654.—An order granting conditionally an application for the use of residence district lots for the temporary storage of excavating machinery and supplies was warranted. Among the conditions were these, that the land during excavation of sand and gravel thereon should be enclosed with a fence affording protection to persons using the streets and sidewalks, and that the applicant after the construction of the storage building should grade the excavated area so as to make it suitable for home lots.

Billboards

UTAH.—*State v. Packer Corporation*, 297 Pac. 1013, 2 Pac. 2d, 114.—The Legislature may restrict tobacco advertising or entirely prohibit it. A statute prohibiting tobacco advertising within the state on billboards and placards, especially as sales to minors are prohibited, is valid under the state and the United States Constitutions. Such advertising by newspapers, magazines and radio, and in interstate commerce, cannot be prohibited by the state.

A statute such as this, prohibiting such advertising by billboard, but not by newspapers, magazines or radio is not unconstitutional as involving arbitrary or unreasonable classification; since billboard advertisements, unlike advertisements in papers and magazines, are wholly within the state, and are constantly before the eyes of all persons in the street, to be seen without choice or volition.

Zoning Ordinance—Board of Appeals—Constitutionality

WISCONSIN.—*State ex rel. Tingley v. Gurda, Inspector of Buildings of the City of Milwaukee*, Circuit Court, Milwaukee County, Branch 8, August 20, 1931.—Mandamus. The relator appealed to the Board of Appeals from the decision of the building inspector denying his application for a building permit. *Held*, that the remedy by appeal to the Board is not an exclusive remedy; nor does the fact that the appeal is pending prevent the maintenance of the mandamus action. Cases cited with approval to the effect that, the ordinance being void (because unreasonable as applied to the relator), no appeal to the Board of Appeals was necessary; the legal or constitutional questions involved not being a subject matter for the determination of the board. These cases hold mandamus to be a proper remedy.

Prevention of Zoning Violations

Edward M. Bassett has written an article of practical value on this subject, which was printed, the latter part of September, in *The New York Times*, *The Evening Post*, and other New York City papers.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

NOVEMBER 2-4.—GREENSBORO, N. C.
American Water Works Association—North Carolina Section. North Carolina Sewage Works Association. Joint annual meeting. Secretary, H. G. Baity, School of Enginering, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 5-7.—FARGO, N. DAK. (50)
North Dakota Water and Sewage Works Conference. Annual meeting. Secretary-Treasurer, A. L. Bavone, Bismarck, N. Dak.

NOVEMBER 6.—DETROIT, MICH.
American Association for Hygiene and Baths. Annual meeting. Secretary-Treasurer, Arthur M. Crane, 917 East 47th Street, Chicago, Ill.

NOVEMBER 9-11.—BUFFALO, N. Y.
National Conference on Government, a combination of the annual meetings of the following organizations: National Municipal League, Secretary, Russell Forbes, 261 Broadway, New York; *Governmental Research Association*, Secretary, Russell Forbes; *National Association of Civic Secretaries*, Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.; *Proportional Representation League*, Executive Secretary, George H. Hallett, Jr.; *American Legislators' Association*, Director, Hon. Henry W. Toll, Equitable Building, Denver, Colo.

NOVEMBER 9-14.—HOUSTON, TEXAS.
Texas Public Health Association. Ninth Texas Sanitarians' Short School. Secretary, E. G. Eggert, State Board of Health, Austin, Texas.

NOVEMBER 11.—WHITE PLAINS, N. Y.
Westchester County Planning Federation. Fall conference. Secretary, Wells F. Wise, Chamber of Commerce, White Plains, N. Y.

NOVEMBER 12-14.—AMES, IOWA. (100)
Iowa Sewage Treatment Conference. Secretary-Treasurer, Lindon J. Murphy, Municipal Engineer, Iowa State College, Ames, Iowa.

NOVEMBER 16-17.—LYNCHBURG, VA.
Virginia Water and Sewer Works Association. Annual meeting. Secretary-Treasurer, H. W. Snidow, Assistant Engineer, Virginia Board of Health, Richmond, Va.

NOVEMBER 18-20.—EDMONTON, ALTA. (250)
Alberta Association of Municipal Districts. Annual convention. Secretary, E. Pinchbeck, Spruce Grove, Alta.

NOVEMBER 30—DECEMBER 4.—CHICAGO, ILL.
American Association of Pools and Beaches, Inc. National Association of Amusement Parks. Convention. Secretary of A. A. P. B., Lyle L. Jenne, 725 Bulletin Building, Philadelphia, Pa.; Secretary of N. A. A. P., A. R. Holge, Riverview Park Co., Chicago, Ill.

NOVEMBER 30-DECEMBER 4.—NEW YORK.
American Society of Mechanical Engineers. Annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

DECEMBER 1.—NEW YORK.
American Institute of Weights and Measures. Annual meeting. Secretary, W. E. Bullock, 33 Rector Street, New York.

DECEMBER 2-5.—WASHINGTON, D. C.
President's Conference on Home Building and Home Ownership. Executive Secretary, Dr. John M. Gries, Department of Commerce, Washington, D. C.

DECEMBER 3-4.—NEW SMYRNA, FLA. (350)
Florida League of Municipalities. Semi-annual meeting. Secretary-Treasurer, E. P. Owen, 1201 Lynch Building, Jacksonville, Fla.

DECEMBER 4-5.—HOUSTON, TEXAS. (100)
Texas City Attorneys' Association. Annual convention. Executive, Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

DECEMBER 8-9.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual congress. Secretary-Treasurer, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 10-11.—WASHINGTON, D. C.
Highway Research Board of the National Research Council. Annual meeting. Director, Roy W. Crum, B and 21st Streets, Washington, D. C.

DECEMBER 28-30.—WASHINGTON, D. C. (400)
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, Hudson View Gardens, Pinchurst Avenue, New York.

JANUARY 9-15.—DETROIT, MICH. (25,000)
American Road Builders' Association, including the following divisions: City Officials', County Highway Officials', Manufacturers', and Pan-American. Annual convention and Road Show. Secretary and Engineer-Executive, Charles M. Upham, National Press Building, Washington, D. C.

JANUARY 15-17.—WASHINGTON, D. C. (100)
American Engineering Council. Annual meeting. Executive Secretary, L. W. Wallace, 744 Jackson Place, Washington, D. C.

JANUARY 18-21.—MILWAUKEE, WIS. (500)
Associated General Contractors of America. Annual convention. Managing Director, E. J. Harding, 222 Munsey Building, Washington D. C.

JANUARY 21.—LEWISTON, IDAHO. (100)
Idaho State Chamber of Commerce. Annual meeting. Secretary, L. F. Parsons, 529 Idaho Building, Boise, Idaho.

JANUARY 25-29.—MILWAUKEE, WIS.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JANUARY 25-28.—CLEVELAND, OHIO. (1,000)
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York.

JANUARY 25-29.—LAFAYETTE, IND. (600)
Purdue Road School. Address: Professor Ben H. Petty, Engineering Extension Department, Purdue University, Lafayette, Ind.

JANUARY 28.—BOSTON, MASS.
Massachusetts Association of Boards of Health. Annual meeting. Secretary, George T. Lennon, Department of Health, Haverhill, Mass.

FEBRUARY 10-13.—CHICAGO, ILL. (350)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

MARCH 1-4.—WASHINGTON, D. C. (800)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 2970 West Grand Boulevard, Detroit, Mich.

MAY 2-6.—MEMPHIS, TENN. (1,500)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 23, WEEK OF.—LONDON, ENGLAND.
International Congress of Local Authorities. (Followed by tours in England and Scotland during the next two weeks.) General Secretary, E. Vinck, Rue de la Régence, Brussels, Belgium; General Secretary of the British Organization, G. Montagu Harris, Ministry of Health, Whitehall, London, S. W. 1. American inquiries may be addressed to Luther Gulick, Director, National Institute of Public Administration, 261 Broadway, New York.

SEPTEMBER 28-30.—PITTSBURGH, PA. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

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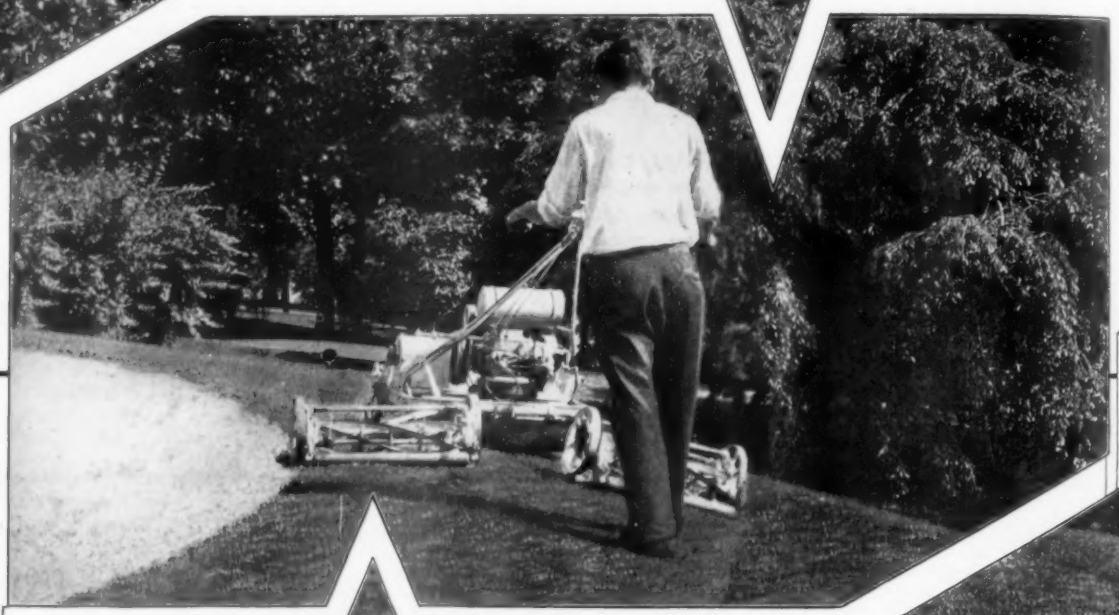

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

A Municipal Handbook

The City Officials Manual, Kansas. By Albert B. Martin. The League of Kansas Municipalities. 580 pp. $10 *from* THE AMERICAN CITY.

The General Attorney for the League of Kansas Municipalities has compiled and written this comprehensive reference work for local officials responsible for the government and administration of cities as provided for by the constitution and the laws of Kansas. The legal authority for, and the legal powers of, all city departments are given under their appropriate heads, with details as to the responsibilities of each department, with methods of procedure, and with many blanks and forms reproduced. There is a complete reference list of statutes relating to cities. The value of the work is increased by the care with which the contents are indexed and cross-indexed.

Bureau of Investigation

"Bureau of Investigation—A Booklet Concerning the Work of the Bureau of Investigation" (second edition), and "How to Take Fingerprints" (illustrated) are publications of the United States Department of Justice issued for the information of law-enforcement officials and agencies in the United States. 8 pp. each. (Apply to the Department, Washington, D. C.)

Airport Design

Aeronautics Bulletin No. 2 of the U. S. Department of Commerce, "Airport Design and Construction," summarizes data which are now available concerning airport planning, and is published for the information of cities interested in providing adequate airport facilities. 58 pp. (Apply to the U. S. Department of Commerce, Washington, D. C.)

Lighting for Aviation

Reprints may be obtained of four papers which discuss the use of lighting in connection with airports and aviation. These papers were presented at the Silver Anniversary Convention of the Illuminating Engineering Society, held in Pittsburgh in October, and include "Airport Lighting," the report of the Sub-Committee on Airport Lighting, by K. W. Mackall, Chairman (43 pp.); "Airways Lighting," the report of the Sub-Committee on Airways Lighting, by D. C. Young, Chairman (19 pp.); "Airplane Lighting," the report of the Sub-Committee on Airplane Lighting, by R. W. Cost, Vice-Chairman (24 pp.); and "Transmission of Light Through Fog," by F. C. Breckenridge, Associate Physicist, Bureau of Standards, Washington, D. C. (Apply to the Illuminating Engineering Society, 29 W. 39th St., New York.)

Fire Fighting

An illustrated bulletin of this title, subtitled "An Analysis of the Fireman's Job, with Suggestions as to the Organization and Operation of Training," reports a study made by the Federal Board for Vocational Education at the request of the International Association of Fire Chiefs. Chapters are headed "Discussion of the Problem of Education and Training for Firemen," "Analysis of the Fireman's Job," and "Teaching Outlines and Samples of Instructional Material." 142 pp., including a bibliography. Well illustrated. 30c. (Apply to the Superintendent of Documents, Washington, D. C.)

Fire Appliances

"Regulations of the National Board of Fire Underwriters for the Installation, Maintenance and Use of First Aid Fire Appliances, as recommended by the National Fire Protection Association," effective October 15, 1931, have been issued by the National Board of Fire Underwriters in pocket handbook size, superseding the edition of 1930. Various types of extinguishers and the proper method of handling them are illustrated. 78 pp. (Apply to the Board, 85 John St., New York.)

Water Analysis

Examination of Water—Chemical and Bacteriological.—By William P. Mason, Professor Emeritus of Chemistry, Rensselaer Polytechnic Institute; revised by Arthur M. Buswell, Professor of Chemistry, University of Illinois; Chief, Illinois State Water Survey. Sixth edition. John Wiley & Sons, Inc., New York. 1931. 224 *pp.* $3.00.

Technical instruction prepared and presented in an interesting manner characterizes the sixth edition of this standard textbook for students of water chemistry and bacteriology. The spirit of the original work of Professor Mason is preserved in this latest edition. Few changes have been made except where it was necessary to bring the terminology up to date, and the new edition differs chiefly from the former in the addition of the newer analytical procedures. The methods for the determination of pH and free chlorine are notable examples. The appendix has been enlarged to include certain references not easily accessible to the student. The analytical methods are in harmony with the recommendations of the Standard Methods Committee of the American Public Health Association.

Specifications for Materials

"The Economic Significance of Specifications for Materials" is the title of a symposium held in Chicago in June under the joint auspices of the American Society for Testing Materials and the Western Society of Engineers. The six papers which were presented at that meeting were published in the *Proceedings of the American Society for Testing Materials*, Vol. 31, Part II, 1931, and have been reprinted in a separate pamphlet of 46 pages. (Apply to the Society, Philadelphia, Pa.)

Service to Transients

"A Community Plan for Service to Transients" has been prepared by the National Association of Travelers Aid Societies at the request of the President's Organization on Unemployment Relief, and is published by the U. S. Department of Commerce, which offers it to local communities "in the belief that it may serve as a helpful guide in dealing with the problem of transient families." The suggested program embodies adaptable features of plans worked out in a number of cities which have attempted to make an intelligent and practical approach to the problem. 19 pp. (Apply to the Dept. of Commerce, Washington, D. C.)

Community Planning

To assist civic organizations and individuals in the region around the Port of New York who want help in meeting the critical situation which they realize will be forced upon their communities by the inevitable growth of the region, the New York Regional Plan Association has published a second edition of "Community Planning—A Manual of Practical Suggestions for Citizen Participation," by Wayne D. Heydecker and W. Phillip Shatts. The demand for the manual was so great that a second edition was necessary and it is now available. 38 pp. (Apply to the Association, 400 Madison Ave., New York.)

Chemical Fire Hazards

"Fighting Fires Which Involve Chemicals" is a booklet by Lionel K. Arnold, Assistant Chemical Engineer, Engineering Experiment Station, and Lindon J. Murphy, Municipal Engineer, Engineering Extension Service, Iowa State College of Agriculture and Mechanic Arts. The College had received a number of requests from Iowa firemen for authoritative reference material in this field, and "it was with the thought of analyzing the different chemical hazards and of explaining their proper handling in a fire that this booklet has been prepared." 31 pp. (Apply to the Engineering Extension Service, Iowa State College, Ames, Iowa.)

Airports

Municipal Airports.—By Jos. H. Wenneman. The Flying Review Publishing Co., Cleveland, Ohio. 1931. 906 *pp.* $12.50 *from* THE AMERICAN CITY.

This large and diversified volume, the author of which is a member of the Cleveland bar, is primarily concerned with legal factors, including a brief historical study, the text of Federal legislation on the subject (and of some Federal regulations), a digest of state laws, and the city ordinances relating to principal municipal airports. "The Right of Flight" is discussed at some length in the light of old and new decisions. Certain special subjects are taken up by the author in some detail, including liability of aircraft operators; aviation insurance; and 64 pages of various business forms useful for airports. Leading airports are described in brief detail, and there are some statements and suggestions about management; but technical details of airport construction and operation, not of a legal character, are necessarily slighted in favor of the compendious treatment of the legal side.

Sludge Temperatures

Studies of "Sludge Temperatures and Capacities of Digestive Tanks" and "Gravel as Trickling Filter Medium," by E. W. Steel, Professor of Municipal and Sanitary Engineering, and P. J. A. Zeller, Research Associate, Agricultural and Mechanical College of Texas, are published in Bulletin No. 40 of the Texas Engineering Experiment Station. 16 pp. (Apply to the Station, College Station, Texas.)

Prisons

The September number of the bi-monthly *Annals* of the American Academy of Political and Social Science is entitled "Prisons of Tomorrow," and is edited by Edwin H. Sutherland, Professor of Sociology, University of Chicago, also Chairman, Committee on Crime, Social Science Council; and Thorsten Sellin, Bureau of Social Hygiene, Inc., New York City, and Professor of Sociology, University of Pennsylvania. The present and the past are reviewed in articles by qualified authors to determine what should be done in the future. Part I, The American Prison; Part II, Prisons Abroad. 262 pp., bound and unbound volumes. $2.50 and $2.00. (Apply to the Academy, 3622 Locust St., Philadelphia, Pa.)

Housing

An address on "New Housing Ideas from Europe," delivered by Edward A. MacDougall at the Lake George convention of the New York State Association of Real Estate Boards, has been published in pamphlet form. Mention is made of various housing developments in Germany, a number of which are illustrated. 25 pp. (Apply to Mr. MacDougall, 60 E. 42d St., New York.)

Municipal Courts

The latest addition to the Philadelphia Municipal Court Survey Series (former volumes of which have been reviewed in this department) is the "Statistical Department of the Municipal Court of Philadelphia," prepared by Kate Holladay Claghorn, Ph.D., of the Faculty of the New York School of Social Work. 123 pp. 1931. Free to officials and others interested. (Apply to Thomas Skelton Harrison Foundation, 311 S. Juniper St., Philadelphia, Pa.)

Regional Planning

The "Initial Report of the Regional Planning Commission, Hamilton County, Ohio," has been prepared by Myron Day Downs, Engineer, and Ladislas Segoe, Consultant. The activities and program of the Commission are described and tentative plans of major thoroughfares and parks, boulevards and parkways are presented. The Regional and County Planning Law and County Subdivision Rules are published as appendices. 31 pp. (Apply to the Commission, Hamilton County, Ohio.)

Highway Upkeep Expenses Reduced
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Water Purification

The fifth and sixth of the United States Public Health Service's Experimental Studies of Natural Purification in Polluted Waters are now available in pamphlet form, reprinted from the *Public Health Reports*. No. V is "The Selection of Dilution Waters for Use in Oxygen Demand Tests," by Emery J. Theriault, Chemist; Paul D. McNamee, Technical Assistant; and Chester T. Butterfield, Bacteriologist, U. S. Public Health Service. No. VI, "Rate of Disappearance of Oxygen in Sludge," is by Mr. Theriault and Mr. McNamee. 33 and 19 pp., and 10c and 5c, respectfully. (Apply to the Superintendent of Documents, Washington, D. C.)

Brick Association

The 1931 "Proceedings" of the twenty-fifth annual meeting of the National Paving Brick Association, held last February in Pittsburgh, have been published in an illustrated pamphlet of 96 pages. Papers and discussions of various phases of brick pavement design and construction by qualified engineers and constructors are presented. (Apply to the Association, National Press Bldg., Washington, D. C.)

Standards

The "1931 Supplement to Book of A.S.T.M. Standards" is a 144-page pamphlet containing 32 standards adopted or revised by letter ballot of the Society (American Society for Testing Materials) since the 1930 edition of the triennially published "Book of Standards" was issued. Seventeen of the 32 standards are new, the remaining 15 being replacements of existing standards ($1.50). The Society's 1931 "Yearbook" has also been published. It includes general information about the organization, a list of the members, committees, regulations, publications, etc. 352 pp. $1.00. (Apply to the Society, 1315 Spruce St., Philadelphia, Pa.)

Budgets

To meet the lack of material on the administrative problems of small cities, which constitute 88 per cent of the total number of cities in the entire country, the Municipal Administration Service is issuing a series of practical handbooks dealing with all the important phases of small city administration. The first number of the series is a manual on "Budgeting for Small Cities," by A. E. Buck, of the National Institute of Public Administration, who is also editor of the monthly department, "The Taxpayer's Dollar," in THE AMERICAN CITY. Sections in the manual are devoted to The Budget Document and Forms; The Preparation and Adoption of the Budget; and The Execution of the Budget. 21 pp. 25c. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Cuts on Paved Streets

"Methods and Charges—Repairing Cuts on Paved Streets in Cities of the Third Class in Pennsylvania" is a 7-page mimeographed summary of data contained in 31 letters received in reply to a request for information sent out by the State Department of Internal Affairs. (Apply to Hon. Philip H. Dewey, Sec., Dept. of Internal Affairs, Harrisburg, Pa.)

City Government

The October issue of *Survey Graphic* is a special number on City Government, raising the question: "Are cities meeting the challenge of an expanding concept of government?". Thomas H. Reed, Harold W. Dodds, Lincoln Steffens, Henry Bentley, Louis Brownlow, Paul R. Leach, Leonard D. White, Howard P. Jones and Luther H. Gulick contribute to the discussion. 30c a copy. (Apply to Survey Associates, Inc., 112 E. 19th St., New York.)

Detroit's Activities

"The Growth of a City Government," a pamphlet by Lent D. Upson, Director, Detroit Bureau of Governmental Research, is "An Enumeration of Detroit's Municipal Activities." It is a revision of a study made in 1922, since which time there has been a "continued increase in the cost of city government." 22 pp. (Apply to the Bureau, 51 Warren Ave., W. Detroit, Mich.)

Law Observance

Fourteen publications have been issued by the National Commission on Law Observance and Enforcement, of which George W. Wickersham is Chairman. These may be obtained from the Superintendent of Documents, Washington, D. C.

No. 1, "Proposals to Improve Enforcement of Criminal Laws of the United States," Doc. 252, 71st Congress, 2nd Session (House), 5c.

No. 2. "Report on the Enforcement of the Prohibition Laws of the United States," Doc. 722, 71st Congress, 3rd Session (House), 162 pp., 15c.

No. 3, "Report on Criminal Statistics," 205 pp., 40c.

No. 4, "Report on Prosecution," 337 pp., 50c.

No. 5, "Report on the Enforcement of the Deportation Laws of the United States," 179 pp., 30c.

No. 6, "Report on the Child Offender in the Federal System of Justice," 175 pp., 40c.

No. 7, "Progress Report on the Study of the Federal Court," 123 pp., 35c.

No. 8, "Report on Criminal Procedure," 51 pp., 10c.

No. 9, "Report on Penal Institutions, Probation and Parole," 344 pp., 60c.

No. 10, "Report on Crime and the Foreign Born," 416 pp., 75c.

No. 11, "Report on Lawlessness in Law Enforcement," 347 pp., 60c.

No. 12, "Report on the Cost of Crime," 657 pp., $1.10.

No. 13, "Report on the Causes of Crime, Vol. I, 390 pp., 80c, Vol. II, 85c.

No. 14, "Report on Police," 140 pp., 30c (see p. 141, THE AMERICAN CITY, September, 1931).

Concrete Road Slab

Bulletin No. 29 of the Texas Engineering Experiment Station is "Design of the Reinforced Concrete Road Slab from the Viewpoints of Strength and Economy," by L. E. Grinter, Professor of Structural Engineering, Agricultural and Mechanical College of Texas. It describes a new type of concrete road slab offering advantages over present-day types. 88 pp. (Apply to the Station, College Station, Texas.)

Heating and Ventilating

The 1931 edition of the "American Society of Heating and Ventilating Engineers Guide" (Vol. 9) is a leather-covered volume of 983 pages, and includes new information not available in earlier editions. The Guide is described as "an instrument of service for the profession, . . . containing reference data on the design and specification of heating and ventilating systems, based on the *Transactions*, the investigations of the Research Laboratory and the practice of members and friends of the Society." Also included are manufacturers' catalog data and the roll of membership of the Society. $5.00. (Apply to the Society, 51 Madison Ave., New York.)

Electrical Code

The 1931 edition of the National Electrical Code, "Regulations of the National Board of Fire Underwriters for Electric Wiring and Apparatus," recommended by the National Fire Protection Association and approved by the American Standards Association, is in pocket handbook size and contains the revisions and amendments adopted in 1931. 282 pp. (Apply to the Board, 85 John St., New York.)

Purchase Orders

An outline of the purchasing procedure followed by the Pasadena Department of Purchase and Supplies is presented in an article on "Routing Purchase Orders through Proper Departmental Channels," by Irving G. Cooley, City Purchasing Agent, Pasadena, Calif., in *The Purchasing Agent* for October. 3 pp. Copies of *The Purchasing Agent* are 20c each. (Apply to The Purchasing Agent Co., 53 Park Pl., New York.)

Other Reports Received

HARRISBURG, PA.—Annual Report, Harrisburg Chamber of Commerce, year ending September 30, 1931. 34 pp.

NORTH DAKOTA.—Biennial Report, State Department of Public Health, two years ending June 30, 1930. 209 pp.

PHILADELPHIA, PA.—Annual Report, Philadelphia Housing Association. 1930. 44 pp.

RECENT CITY MANAGER APPOINTMENTS

BERNARD S. ALNUTT was recently appointed City Manager of Excelsior Springs, Md., to succeed W. L. Silvers, who had been City Manager for the past three years. Prior to his appointment, Mr. Alnutt had engaged in the banking business.

J. Neil Bass was appointed City Manager of Knoxville, Tenn., on October 15, to succeed George R. Dempster, who had served as City Manager for two years. Mr. Bass had served Knoxville as City Manager from January 1, 1929, to October 1, 1929.

W. M. Brown recently succeeded R. M. Berryhill as City Manager of Tulare, Calif. Mr. Brown had served as Mayor of Tulare from 1923 to 1927 and as Councilman from 1927 to the time of his appointment as City Manager.

C. E. Douglas, who has served as City Manager of Lawton, Okla., Newport News, Va., and Dubuque, Iowa, was appointed City Manager of Glendale, Calif., on September 17 to succeed J. W. Charleville, who resigned September 1 to become City Manager of Pasadena. During the past year Mr. Douglas has assisted Griffenhagen & Associates in making a survey of the municipal activities of Long Beach.

James W. Gladding, who was City Manager of Albuquerque, N. Mex., from 1920 to 1922, was appointed City Manager on October 1, to succeed Robert Lee Cooper, who had served as City Manager since November, 1926.

E. G. Gustafson was recently appointed City Manager of Ft. Pierce, Fla., to succeed D. C. Sample, who resigned on October 1, on account of ill health.

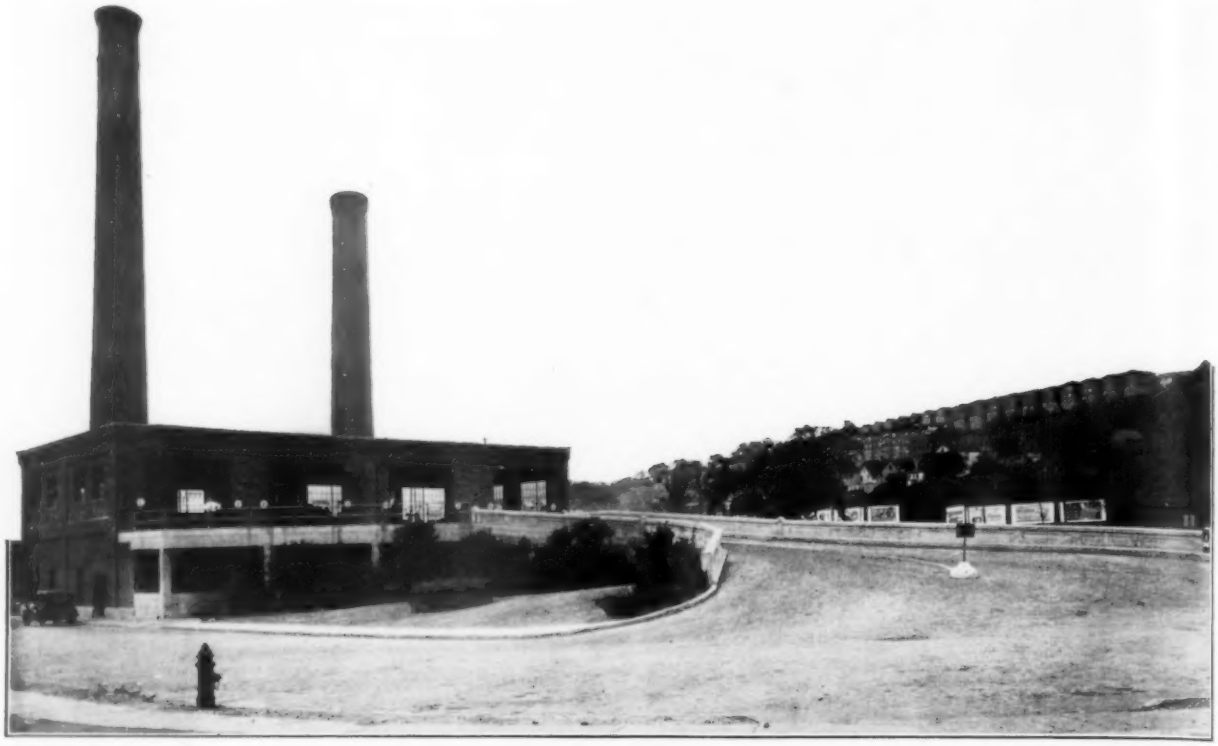
Angus McAllister has been appointed City Manager of La Grande, Ore., to succeed A. B. Cherry, who had been City Manager since January, 1931.

Wayne Ridge was recently appointed City Manager of Anoka, Minn. Prior to his appointment he had served for 20 years as County Surveyor of Anoka County and City Engineer of Anoka. He succeeds H. W. Plummer.

George J. Roark, of Beaumont, Texas, was appointed the first City Manager of Pensacola, Fla., in September. Mr. Roark had served as City Manager of Beaumont from April, 1920, to December, 1923.

R. J. Whitney, City Manager of Royal Oak, Mich., since January, 1926, was recently appointed City Manager of Mamaroneck, N. Y., to succeed Arthur Richards, who resigned the position on October 15.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.



Yonkers, N. Y., Destroys Garbage for 135,000 in a "Pittsburgh-Des Moines" Incinerator

Our Incinerator Catalog contains 24 pages of photographs and reliable cost data from various cities on garbage collection—and disposal with a "Pittsburgh-Des Moines." Interested municipal officials are invited to write for their copy today.

AT the rate of 200 tons every 24 hours—every day in the week—every week in the year—this modern big incinerator does its part to keep progressive Yonkers clean and healthy. "Pittsburgh-Des Moines" installed this plant in 1929.

First, an incinerator must be practical—a steady destructor—that destroys its grist of refuse day after day, without offense to the neighborhood, without annoying smoke, and without odor. The "Pittsburgh-Des Moines" plant is simple to operate—its **"foolproof"** features permit the use of unskilled labor. **All** of the garbage is burned as fuel to keep operating costs low. New charges of garbage are not dumped directly on the fire, but on sloping drying hearths to be dried out **first,** and thus promote more complete and rapid combustion.

View at left shows the interior of the Yonkers stoking room for the four 50-ton furnace units. Each unit has a main and two auxiliary stoking doors and three ash-removal doors at the bottom.

Pittsburgh-Des Moines Steel Company

Room 941, 270 Broadway, New York, N. Y. **3452 Neville Island, Pittsburgh, Pa.**

Chicago **Atlanta** **Dallas** **San Francisco** **Seattle**

Water Rates and Regulations

Part VII—Conclusion

Water-Meter Rates

Hydrant Rentals and Sprinkler Charges

Regulations Covering Taps and the Installation of Service

(Continued from the October issue)

Albert Lea, Minn.—10,169

Cubic Feet per Quarter	Per 1,000 Cubic Feet
First 15,000	$2.50
Next 15,000	1.50
" 20,000	1.10
" 50,000	0.90
Over 100,000	0.70

The minimum gross charge per quarter is $2.50.

The hydrant rental charge is $30.00 per year. No charge is made for private fire sprinkler service.

Brainerd, Minn.—10,221

Gallons per Month	Per 1,000 Gallons
First 40,000	50c
40,000 to 100,000	($20.00 per month minimum)
100,000 to 199,000	18c
199,000 to 299,000	14c
299,000 to 399,000	10c
399,000 to 700,000	8c

Minimum, 75 cents per month.

Duluth, Minn.—101,463

Cubic Feet per Month	Per 100 Cubic Feet
First 10,000	15c
Next 10,000	12c
Over 20,000	8c

Minimum Charges

Size of Meter	Per Month
5/8"	$0.50
3/4"	0.75
1"	1.00
1 1/2"	1.50
2"	2.00
3"	3.00
4"	4.00
6"	6.00
8"	8.00

Private Fire Protection Service
Ready-to-Serve Charge

Size of Connection	Per Month
2"	$2.00
3"	3.00
4"	4.00
5"	5.00
6"	6.00
8"	8.00

The city pays $50 per year for each hydrant to the Water and Light Department.

All services must be installed by licensed plumbers at the expense of the owner, the size of pipe to be installed being subject to the approval of the Department. No service pipe for water may be smaller than 5/8-inch nominal diameter. One curb cock and box will be furnished by the Department for connection to each house service. Meters are furnished and installed by the Department and remain the property of the Department.

Hibbing, Minn.—15,666

Gallons per Month	Per 1,000 Gallons
First 50,000	15c
Next 50,000	12c
Over 100,000	10c

Minimum bill, 85 cents per month.

Hydrant rentals are charged on the basis of $6.17 per hydrant and billed monthly for hydrants within the village limits. Those outside the village limits are billed at $3.17 per month.

The Water, Light, Gas & Heat Department charges $20.00 each for the installation of water taps. This charge covers material and labor for tapping the excavation being done by the owner. A charge of $5.00 is made for each meter installed where the consumer rents the house. No charge is made in the case of property owners.

Minneapolis, Minn.—464,356

The regular charge for water in Minneapolis is 7½ cents per 100 cubic feet, while to municipal departments the charge is 4 cents per 100 cubic feet.

The city does not make any hydrant rentals or sprinkler charges, other than an inspection charge of $5.00 per year.

All taps are made by the city, all service pipe to the meter being either lead or copper. The following charges are made to consumers:

Size of Connection	Cost
5/8"	$4.00
3/4"	5.00
1"	6.00
2" and over	25.00

St. Paul, Minn.—271,606

Cubic Feet per Month	Per 100 Cubic Feet
First 10,000	9c
Next 40,000	6c
" 450,000	4½c
Over 500,000	3c

Service Charges

Size of Meter	Per Year
5/8"	$3.00
3/4"	4.20
1"	7.20
1 1/4"	10.20
1 1/2"	13.20
2"	27.00
3"	60.00
4"	120.00
6"	240.00
8"	420.00
10"	600.00

Service charges for 5/8-inch, 3/4-inch and 1-inch meters are billed quarterly, while those for larger sizes are payable monthly.

The Water Department receives from the city $14.00 per year per hydrant.

Automatic fire services are installed by the Department at the owner's expense and carry the following charges:

Size of Connection	Per Year
4"	$25.00
6"	50.00
8"	150.00
10"	240.00
12"	360.00

Water services are installed by the Department from the main to the property line and are paid for by the consumer in accordance with the following schedule:

Width of Street	Size of Connection 3/4-Inch	1-Inch	1 1/2-Inch
120'	$57.00	$71.00	$93.00
100'	52.50	65.00	81.00
90'	49.00	60.00	76.00
80'	45.00	56.00	71.00
70'	41.50	52.50	66.00
66'	40.25	50.00	62.50
60'	39.00	47.50	58.50
55'	36.50	43.50	55.00
50'	33.50	40.00	51.00
45'	32.00	37.50	47.50
40'	29.00	35.00	43.50
30'	27.00	31.00	40.00

An additional charge is made where part or all of the excavation is in rock. Second pipes are installed in the one ditch at a lower rate than that above. Services larger than 1½ inches are installed at actual cost.

Between the property line and the building, services are installed only by master plumbers, licensed by the Department. Work done by the Department is guaranteed for a 30-year period, after which repairs are paid for by the owner.

Virginia, Minn.—11,963

Cubic Feet per Month	Per 100 Cubic Feet
First 10,000	8c
Next 10,000	6c
Over 20,000	5c

Minimum, 25 cents per month.

A discount of 10 per cent is allowed on all bills paid promptly.

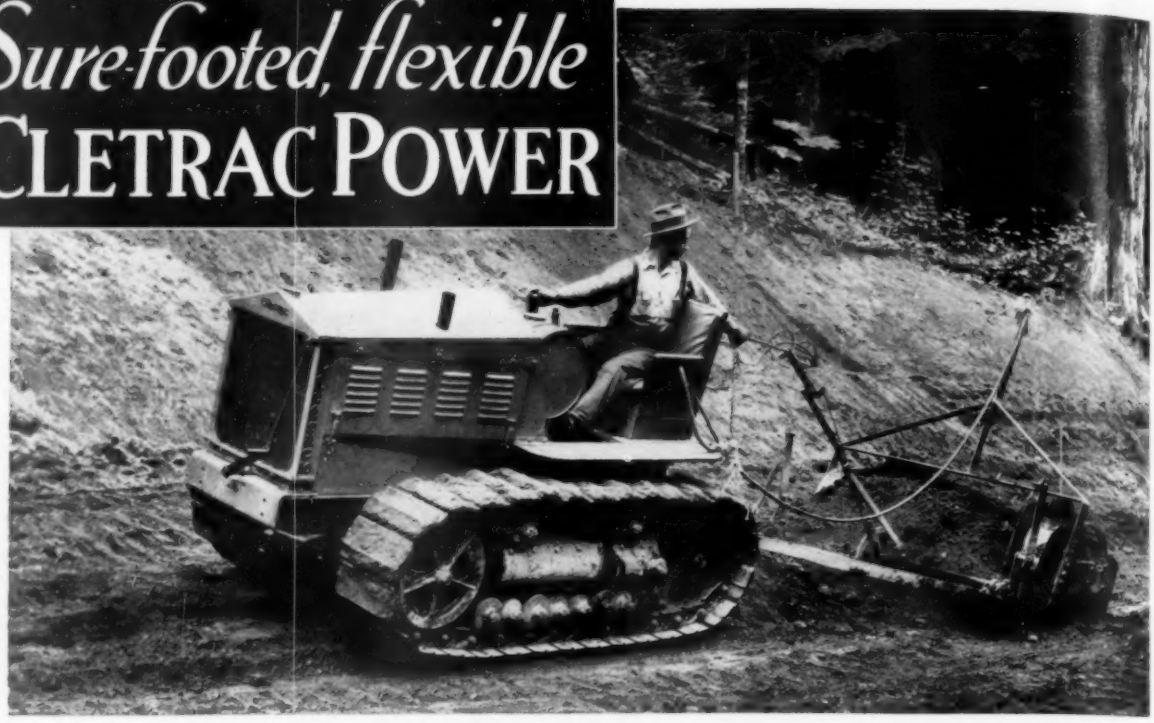
Hydrant Rental Charges

First 50	$100 each per year
Next 50	80 " " "
Over 100	60 " " "

For 160 hydrants, the city pays $12,600 per year. No sprinkler or private fire service charges are made.

For making taps for domestic service installations, the charge is $1.00 each, the consumer making his own connections. For larger sleeve taps, the actual time and material charges are made.

Sure-footed, flexible CLETRAC POWER



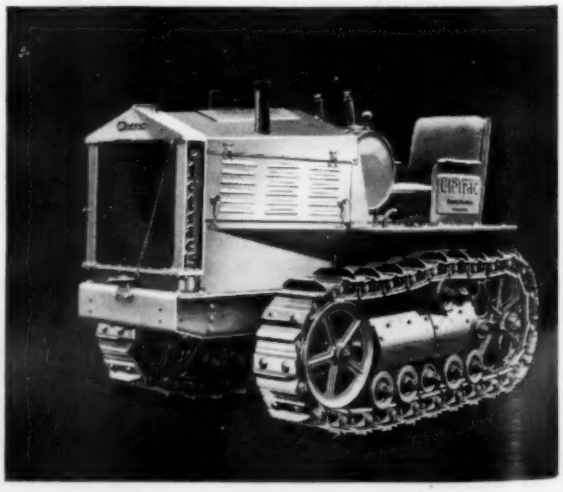
. . . put it to work and watch costs tumble!

RIGHT from the start, Cletrac Crawler Tractors can show you substantial savings on your operating costs. Whether it's a dirt-moving job with fresno, bull-dozer or elevating grader — a maintenance job on a highway—or handling huge plows for snow removal—there's a Cletrac Crawler to do the work at quicker speed and lower cost.

Cletracs' ability to travel fast, haul tremendous loads and go anywhere, makes them supreme for every type of heavy-duty tractor work. They can maneuver in tight places where others can hardly operate. They control easily and can turn in practically their own length. Sure-grip traction fits them for tough grades and bad going. Continuous gravity oiling eliminates the daily job with grease gun and oil can.

For heavy road work and wherever giant power is needed, the big Cletrac "80-60" is the ideal tractor. For smaller requirements the Cletrac line provides four other units from 15 h. p. up. Let the Cletrac distributor near you show how these famous tractors are cutting costs and speeding up work for thousands of other tractor users. Let him demonstrate how, with Cletrac, your work too can be done faster and better — and at a big saving.

THE CLEVELAND TRACTOR COMPANY
19326 Euclid Avenue Cleveland, Ohio



CLETRAC
CRAWLER TRACTORS

Winona, Minn.—20,850

Gallons per Month	Per 1,000 Gallons
5,000 or less	30c
5,000 to 10,000	23c
10,000 to 15,000	15c
15,000 to 150,000	12c
Over 150,000	9c

MINIMUM CHARGES

Size of Meter	Per Month
⅝"	$0.75
¾"	1.00
1"	1.50
1½"	2.50
2"	3.50
3"	4.50
4"	5.50
6"	8.00
8"	10.50
10"	13.50

Bills are subject to a 10 per cent discount for prompt payment.

Meter rentals are collected on all meters 3 inches and larger for a period of 10 years of active service after the date of installation of the meter, according to the following schedule:

Size of Meter	Per Month
3"	$1.35
4"	2.00
6"	4.00
8"	6.50
10"	8.00

Where meters are installed to supply a sprinkler system, for extra fire protection or for any other purpose where a regular supply of water is not used, consumers have the privilege of purchasing meters for such use from the Board of Municipal Works.

No tap may be put into any main except under the immediate direction of the Secretary of the Board, and no tap may be used in excess of ⅝-inch inside diameter, except by special permission, and on condition that an approved sleeve and valve are installed. The corporation cock and lead pipe, sleeves and valves to be used in connecting service pipes with the main will be furnished by the Board at a reasonable price.

Havre, Mont.—6,372

Gallons per Month	Per 1,000 Gallons
First 10,000	30c
10,000 to 20,000	25c
20,000 to 50,000	20c
50,000 to 200,000	16c
200,000 to 600,000	14c
600,000 to 5,000,000	12c

MINIMUM METER CHARGES

Size of Meter	Per Month
⅝"	$1.25
¾"	1.50
1"	2.00
1½"	3.00
2"	5.00
3"	8.00
4"	10.00
6"	12.00

Hydrant rentals are $40 each per year. The rates for private fire services are as follows:

Size of Service	Per Month
1"	$1.00
1¼"	1.50
1½"	2.00
1¾"	2.50
2"	3.00
2¼"	3.50
2½"	4.00
2¾"	4.50
3"	5.00

Taps for services are made by the Water Department. The consumer installs and maintains the services from the main to the house, which are required to be of either copper or lead, the minimum size of tap being ½-inch.

Billings, Mont.—16,380

Cubic Feet per Month	Per 100 Cubic Feet
First 1,000	25c
Next 1,000	15c
" 48,000	10c
" 50,000	8c
" 100,000	6c
Over 200,000	5c

Bills are subject to 10 per cent discount if paid during the first ten days of the month. The minimum charge is $1 per month. All services are metered, except fire services.

The rates for fire services are:

Size of Connection	Per Month
2"	$1.66⅔
3"	2.08⅓
4"	2.50
6"	3.33⅓

Fire hydrants are billed at $30 each per year.

Service pipes are installed by the Water Department but are charged to the property owner. Either lead or copper service pipe is used for the smaller services, cast iron pipe being used for those 2 inches or larger.

A special summer street-service schedule was put into effect in 1931, giving a 25 per cent discount on water rates from May 15 to September 15. Application for this rate must be made by the consumer on or before May 15 of each year. Should the application be made after this date, the rule applies only to that portion of the season remaining after the 15th of the month following the date of application. The applicants are required to improve and maintain a lawn on the parking strip or boulevard in front of their property. The rate is made for the purpose of encouraging the production and growth of lawns, trees and gardens. Should it be evident that there is an attempt on the part of any consumer to defraud or misconstrue the intent of the reduced rate, it is considered sufficient cause to deprive the consumer of the benefit of the rate. This discount is in lieu of the regular prompt payment discount and is not allowed to any consumer who is in arrears with the Water Department, or on any account not paid on or before the 10th of the month following the date of the bill. The discount is not allowed on minimum bills or on any discount for services located outside of the city limits of Billings.

Belleville, N. J.—26,974

A minimum semi-annual charge of $4.25 is made by the Bureau of Engineering for the first 2,000 cubic feet. All in excess of this amount is charged at the rate of $1.85 per 1,000 feet. A sliding discount rate is available to large consumers.

Ten dollars per year per hydrant is paid by the Fire Department to the Water Department for hydrant rental. All other hydrant service is metered and the majority of sprinkler systems are metered.

Taps are installed from the main to the curb line at the following rates:

Size of Service	Charge
⅝"	$35.00
1"	45.00
2"	115.00

Larger services are installed at cost plus 10 per cent. Service from the curb to the house is installed by a plumber and inspected by the municipal plumbing inspector. Services in Belleville are 97 per cent metered.

East Orange, N. J.—68,020

The city of East Orange makes a minimum charge of $1.70 per quarter, allowing 50,000 cubic feet. For all over 50,000 cubic feet per quarter, the charge is $1.50 per 1,000 cubic feet. Bills are due on day of presentation and become arrears 30 days after issue.

MINIMUM CHARGES

Size of Meter	Per Quarter
⅝"	$1.70
¾"	4.30
1"	6.00
1½"	15.00
2"	20.00
3"	45.00
4"	65.00
6"	125.00
8"	200.00

FIRE LINE SPRINKLER RATES

Size of Meter	Per Year
3"	$45.00
4"	65.00
6"	125.00
8"	200.00

The connection fee for the use of city water and the charge for putting in service pipes are as follows:

Size of Tap	Charge	Size of Pipe	Per Linear Foot	Stop-Cocks or Valves
¾"	$35.00	¾"	$0.95	$3.00
1"	45.00	1"	1.17	7.00
1½"	60.00	1½"	1.30	10.00
2"	70.00	2"	1.45	15.00
3"	100.00	3"	1.70	30.00

For making connections in permanent paved streets, $35 will be added to the tapping fee. Special rates will be quoted for services over 3 inches or when ground is frozen.

Haverhill, Mass.

Water rates charged by the municipal water works of Haverhill, Mass., are as follows:

Cubic Feet per Day	Per 100 Cubic Feet
300 or less	16c
300 to 600	14c
600 to 1,000	12c
1,000 to 2,000	10c
Over 2,000	7½c

The meter rental charge is 10 per cent of the cost of the meter. The minimum charge of $10 per year entitles the consumer to use 6,250 cubic feet of water. Meters are furnished by the city and are set free of charge. A discount of 25 per

Low-Cost Dump Equipment Built for Rugged Service

THE new SPEED WAGON excels in road building service because of greater piston displacements, larger bearing surfaces and full force feed lubrication in the four and six cylinder engines; because of a husky transmission, a deep-channeled frame, long, wide springs, full floating rear axle and perfectly equalized hydraulic brakes. Moreover, the new gravel dump bodies and equipment have been thoroughly engineered to the Reo SPEED WAGON chassis.

REO MOTOR CAR COMPANY · LANSING · TORONTO

THE NEW 1½ TON REO SPEED WAGON

Reo Trucks and Speed Wagons range from 1½-ton to 4 tons. Prices $625 to $2800, chassis f. o. b. Lansing

$625

Four-cylinder $62[illegible]
Six-cylinder $72[illegible]
Chassis f. o. b. Lansing, Michigan
Dual Wheels $22 extra

cent is allowed on all water bills paid within 15 days of the date of the bill, there being no discount on the meter rental.

No charge is made for hydrant rentals, public or private. The owner pays the entire cost of the installation.

The Water Department makes all taps on the water mains, the owner of the property paying for the installation of the service pipe from the main to the inside of the cellar, including the cost of the pipe, fixtures and labor costs. The Department charges the actual cost of installation and service.

Kalispell, Mont.—6,094

Gallons per Month	
First 2,000	$1.00 minimum
	Per 1,000 Gallons
2,000 to 10,000	40c
10,000 to 20,000	35c
20,000 to 50,000	30c
50,000 to 100,000	25c
100,000 to 200,000	20c
200,000 to 300,000	15c
300,000 to 500,000	10c
Over 500,000	7½c

No revenue is received from hydrant rentals.

The city will make all taps and furnish the corporation cocks, at the following charges:

Cast iron pipe ¾"	$5.00
Cast iron pipe 1"	6.00
Kalamein pipe ¾"	6.50
Kalamein pipe 1"	7.50
Wood pipe ¾"	4.00
Wood pipe 1"	5.00

All service pipe must be laid at least 4 feet below the surface of the ground, and extra-strong lead pipe must be used on paved streets. Either lead or galvanized iron pipe may be used on streets not paved.

Keene, N. H.—13,794

Cubic Feet per Quarter	
First 500	$1.50 minimum
	Per 100 Cubic Feet
Next 9,000	17c
" 9,000	12c
" 9,000	10c
" 9,000	7c
" 9,000	5c
Over 45,500	3c

No hydrant rentals are charged and there is no charge for private fire service or sprinklers.

The Water Department will make all connections and furnish and lay all pipe to the inside of the cellar wall, for the following charges:

¾" tap, ¾" pipe to street line $11.00
From street line to cellar, 40 cents per foot
¾" lever handle stop and waste cock, $1.65

¾" tap, 1" pipe to street line, $12.00
From street line to cellar, 45 cents per foot
1" lever handle stop and waste cock, $2.50

1" tap, 1" pipe street line, $13.50
From street line to cellar, 45 cents per foot
1" lever handle stop and waste cock, $2.50

1" tap, 1¼" pipe to street line, $15.00
From street line to cellar, 50 cents per foot
1¼" wheel valve, $4.00

Rochester, N. H.—10,209

Gallons per Day	Per 1,000 Gallons
95 to 1,499	20c
1,500 to 2,999	17½c
3,000 to 4,999	15c
5,000 to 9,999	10c
10,000 to 19,999	7½c
20,000 to 49,999	5c
50,000 or more	3c

The minimum charge of 35,000 gallons or less per year is $7.

Property owners may purchase water meters at any time. For meters supplied by the Water Department, and set up at its expense, there will be charged an annual rental as follows:

Size of Meter	Per Year
⅝"	$1.50
¾"	2.50
1"	3.50
1¼"	4.50
1½"	6.00
2"	12.00
3"	18.00
4"	25.00
6"	60.00

All water mains and service pipes, gates and stop cocks will be supplied and laid by the city under the direction of the Superintendent of Water Works. All service pipes will be laid from the street main through the cellar wall, and the expense for the line from the curb line, together with the cost of a suitable stop and waste inside the building, must be paid by the owner.

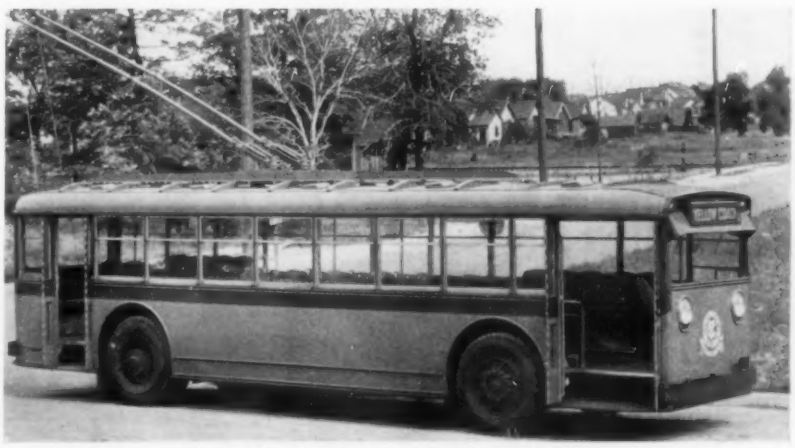
The Water Rates and Regulations articles published each month since May, 1931, give water-rate schedules in a large number of places. The rate schedules cover domestic and industrial meter rates, hydrant rentals, and charges for private sprinkler systems attached to city mains, and the regulations governing the installation of new services.

Trolley Busses, Exclusively, for Public Transportation System in Kenosha

A TRANSPORTATION system consisting entirely of trolley busses will go into operation in Kenosha, Wis., before the end of 1931. This system, in a city of nearly 50,000 population, is believed to be the first in the country in which all street cars and gasoline busses are replaced by trolley busses.

Twenty-two 42-passenger trolley busses, each equipped with two General Electric 35-horsepower automotive-type motors, are being built for the Wisconsin Gas and Electric Co., twelve by the General Motors Truck Corporation and ten by the St. Louis Car Co. Each bus will be equipped with G.E. series contactor control with selective rates of acceleration and deceleration.

Plans for the elevation of the Chicago and Northwestern Railroad tracks through Kenosha necessitated comprehensive alterations of the existing system of street-car tracks. An exhaustive study of the cost of continuing street-car service with its attendant large investment in track changes, and the extension of gasoline bus service, compared with the substitution of trolley busses throughout the system, showed the newer form of electric transportation to be most advantageous.



ONE OF THE NEW 42-PASSENGER BUSSES

The economic status of the present trolley transportation systems in some sections is uncertain. The presence of trolley tracks and of the inflexible boarding zones in the congested areas of other cities constitutes traffic delays and dangers. For these reasons and others, the Kenosha experiment is of more than local interest.

WHY Your Next Bulldozer Should Be A TRACKSON

FIRST of all, because it is sensibly designed for such work. The motor unit, instead of protruding ahead of the crawlers, is placed well back to equalize the weight of the bulldozer. This corrects the usual tendency to tipping, and increases traction. The hoisting assembly furnished also fits the Trackson Low Shovel. Thus either attachment is readily interchangeable, giving you essentially two dirt-moving units for little more than the price of one. The crawlers are of extremely simple design, with wide clearances for easy lubrication and adjustment. The track shoes and drive sprockets are readily reversible for extra wear. All these features mean longer service and lower upkeep on any bulldozing operation. Write for full details. TRACKSON COMPANY, 1322 So. First Street, Milwaukee, Wis.

TRACKSON
TRACTOR EQUIPMENT

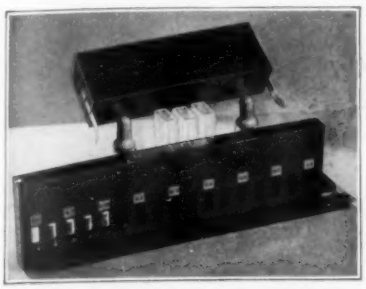
Do you mention THE AMERICAN CITY? Please do.

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

New Chlorine Comparators

Three new comparators, known as the Enslow Slide Chlorimeter, the Taylor swimming pool set, and the combination swimming pool set for control of chlorine and pH in water, sewage, and swimming pools, have been announced by W. A. Taylor & Co., 872 Linden Avenue, Baltimore, Md. All of this equipment is



THE ENSLOW CHLORIMETER

molded from Bakelite and works on the slide principle, thus combining durability, precision, convenience and simplicity.

All of these sets are similar in construction and in method of operation. Each consists of two principal parts, the slide and the base, as shown in the illustration. The slide is a Bakelite case 10 x 2.75 x 6.25 inches. It contains nine color standards representing different amounts of chlorine or pH values, and eight ampoules of distilled water, the ampoules of water alternating with the color standards. The lower part of the base contains a slot in which the slide may be moved back and forth, two holes containing vials of orthotolidine or phenol red solution, or both, and three holes containing molded Pyrex cells 89 x 25 x 11 mm. The upper half of the base serves as a cover for the vials and cells when the set is not in use, and is fastened to the lower part by means of spring catches.

The Enslow Slide Chlorimeter contains nine chlorine standards representing 0.0, 0.1, 0.15, 0.2, 0.3, 0.4, 0.6, 0.8, and 1.0 p.p.m. of chlorine. A determination consists of three simple operations: (1) the three cells are filled to the mark representing 11.5 cc. with the sample to be tested, and placed in the three holes in the base; (2) to the central cell 0.5-cc. of orthotolidine solution is added, and the contents thoroughly mixed; (3) the slide containing the chlorine standards is placed in position on the base and is moved back and forth in front of the test samples until a color match is obtained. The chlorine content is then read directly from the values on the front of the slide.

The Taylor swimming pool set is similar in all respects to the Enslow Slide Chlorimeter except that the slide is divided into two sections. The left section contains five phenol red standards representing pH values 6.8, 7.2, 7.6, 8.0, and 8.4, and the right section four chlorine standards representing 0.0, 0.2, 0.5, and 0.8 p.p.m for chlorine determination. The base contains one vial each of orthotolidine and phenol red solution.

The combination swimming pool set consists of one complete Enslow Slide Chlorimeter and an additional slide containing nine phenol red color standards representing pH values of 6.8, 7.0, 7.2, 7.4, 7.6, 7.8, 8.0, 8.2, and 8.4. This set allows more precise control of both chlorine and pH than is obtained with the single slide set.

Each of these sets is supplied in a polished wooden case 11 x 3.75 x 4.75 inches, with a handle for carrying. The case serves not only to keep the equipment together in portable form but also to protect the sets from dust and dirt when not in use.

A Vibrating Screen for Bucket Loaders

A new three-product vibrating screen for use with Model 62 heavy-duty self-feeding bucket loaders has just been introduced by the Barber-Greene Company, Aurora, Ill. The screen is designed for operation in gravel pits, on road jobs or in any place where bulk material must be classified by size. It will take gravel direct from the bank, in a pit, and load it out as oversize gravel and sand. When such fine classification is not desired, the screen may be converted into a two-product unit by removing one screen cloth.

The new screen is made up of two screen cloths vibrated at 1,200 v.p.m. by an alloy-steel eccentric shaft driven by a power take-off direct from the main transmission of the loader. A belt that can be easily removed and rethreaded transmits the power to the screen. This belt is provided with an automatic take-up to compensate for stretch or contraction. The entire screen frame is vibrated in the center and cushioned on each end, and is counterbalanced so that no vibration is carried back to the loader frame.

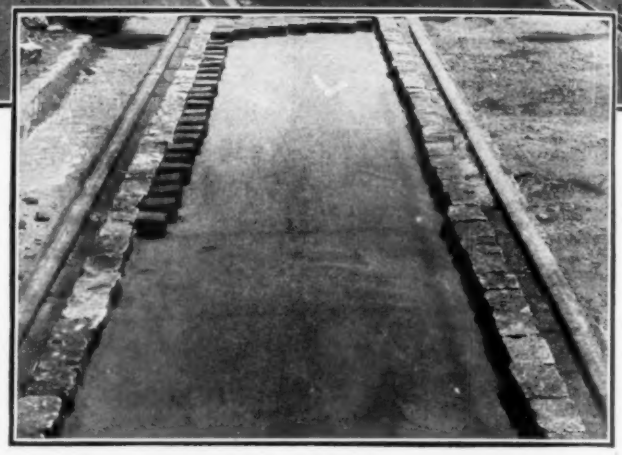
Material discharged from the buckets of the loader falls first on a large screen cloth which removes oversize, carrying it off over a steel chute. Shaken through the first screen, the material drops on a finer mesh below. Material of very finest size falls through this cloth onto a rubber belt conveyor which carries it out and discharges it at a point 9 feet from the center of the machine. The material remaining on the second screen passes off over a chute directly in back of the loader, and in this way two trucks may be loaded at the same time. The screen cloths are furnished in sizes to fit the individual users' needs for sand and gravel sizes.

THE MODEL 62 BARBER-GREENE BUCKET LOADER WITH VIBRATING SCREEN

The Barber-Greene Co. has announced the appointment of F. D. Hooper as General Sales Manager. Mr. Hooper was formerly Sales Manager of the Lidgerwood Manufacturing Co., of Elizabeth, N. J. He is a Cornell graduate and was employed by the Lackawanna Steel Co., now Bethlehem Steel, and the Boston and Maine Railroad, before starting his 24 years of continuous service with Lidgerwood.

Caterpillar Tractor Co. Announces Changes

Caterpillar Tractor Co., Peoria, Ill., has announced the appointment of G. M. Walker as Advertising Manager. Walter H. Gardner, formerly Advertising Manager, has been made Manager of the Specialty Sales Division. This newly formed division is created primarily to market Caterpillar engines and sub-assemblies to other manufacturers. The full line of Caterpillar engines, both gas and diesel, will eventually be adapted for the use of equipment manufacturers generally.



(Above) North Illinois Street, Indianapolis, Ind.

(Right) Same paving partially completed

Carey Elastite

RAIL FILLER

INSURES TRACK PAVING

Paving next to tracks must be protected from track vibration. The more permanent the paving, the greater the need. The combination of modern, heavy rails and large cars means that the track transmits terrific shocks which attack even the most resistant pavement. The damage is progressive because vibration play increases as vibration limits grow larger.

Carey Elastite Rail Filler placed in the web of the rail, absorbs vibration which would otherwise cause speedy damage. The material is a tough asphalt compound which offers maximum resistance to shock, temperature changes and moisture. Premoulded to fit any rail section, it is quickly installed and repays its cost in a short time by reducing paving repairs.

Prices and complete engineering data will be mailed on request.

THE PHILIP CAREY COMPANY × Lockland, Cincinnati, Ohio

Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey PRODUCTS

HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
ASFALTSLATE SHINGLES
BUILDING PAPERS

521

THE SNOW KING ROTARY PLOW IN ACTION

Rotary Snow-Plow for Four-Wheel-Drive Trucks

With enlargement of the snow-removal program and the necessity for fully cleared roads to accommodate the ever-increasing stream of winter traffic, a type of snow-removal equipment is needed that combines capacity with speed. Models of the Snow King rotary plow, made by the Rotary Snow Plow Co., 1611 Central Avenue, Minneapolis, Minn., are designed to meet these requirements.

Attaching the Snow King to a fast-moving truck having four-wheel-drive provides a unit that can reach the most distant drift in a short space of time, making it possible to remove the snow before it becomes frozen and solidly packed, with an additional saving of time, as fresh snow is more readily handled.

The truck motor alone is used while carrying the plow or for work in light snow. As the snow becomes deeper and the load too great for the single motor, the second power unit is engaged, leaving the truck motor free to operate the rotors. The use of the truck motor to propel the rotors permits of direct connection to the crankshaft and avoids transmitting power through long shafts with right-angle turns. The second power unit, which is installed on the rear of the truck chassis, is also directly connected to the transmission, and may be readily removed at the end of the winter, or used as a stationary power plant to operate hoists, draglines, etc. Control of both the truck and the second power unit is handled by one operator. A separate set of levers and controls is located in the cab. The second power unit provides a gear reduction at all speeds one-third that of the truck, thus giving a double range of speeds from low to high.

The revolving chutes of the Snow-King rotary plow permit snow to be thrown in any direction and always with the wind. The snow stream can be controlled to permit throwing to a distance or close by, and high enough to allow traffic to pass under when throwing snow across the highway. The condition of the snow has no effect upon the operation, and there is no clogging of chutes.

A power-operated hoist located in the cab is used for raising the plow quickly and lowering it gently. An automatic release prevents lifting beyond the limit of safety. The entire unit, including the clutch brake and gear, is contained in the transmission housing. The worm is cut from the stock of the pinion shaft and drives the worm gear. This in turn revolves on two ball bearings set on the cross-shaft. All parts are enclosed and lubricated.

A Powerful and Economical One-Man Patrol Grader

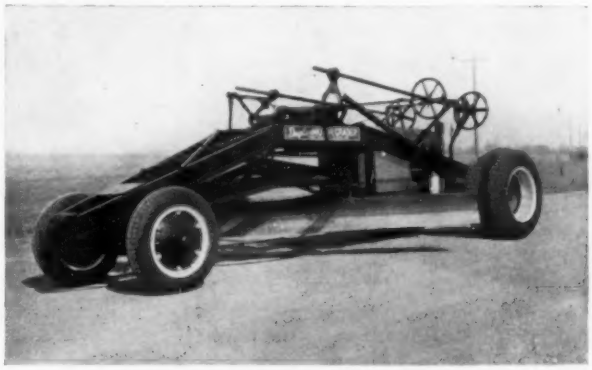
The Model 20 Duplex motor grader, made by the Duplex Manufacturing Co., 21st and Locusts Streets, East Omaha, Nebr., is a powerful and economical one-man motor patrol in which every part has been carefully tested to insure ample strength and wearing qualities.

The outfit may be purchased complete, or the grader may be bought separately for mounting on a McCormick-Deering tractor. It has a wheelbase of 16 feet and an over-all length of 19 feet. Its weight with the tractor is 11,300 pounds, and without the tractor 4,100 pounds. Blades of 10, 12 or 14 feet may be used, the blade having a side shift of 12 inches each way, and a clearance when lifted of 12 inches. The frame is made of steel channels, and the solid cast wheels are equipped with rubber tires. The front wheels are 32 x 5 inches, and the rear wheels 40 x 10 inches. Non-skid chains, extension rims and flanges may be had as optional equipment.

A Tractor-Powered Roller

The Davenport-Winchell roller, made by the Davenport Locomotive & Manufacturing Corporation, Davenport, Iowa, is an all-purpose unit combining the desirable features of low initial cost, dependability and unusual operating economy. The roller is furnished complete with power plant, or the roller equipment may be obtained separately and readily attached to a McCormick-Deering Model 20 tractor. This feature makes the roller especially economical for those who require a roller at intermittent periods, yet whose needs are not so constant as to justify investment in a single-purpose machine. It is well adapted for road and street work, parks, cemeteries, golf courses and playgrounds.

The roller has a wheelbase of 9 feet 4 inches. Without wheel weights it weighs 3-¾ tons, with small weights 4-¼ tons, and with large weights 5-¼ tons. It has three speeds forward and one reverse, and an improved side cranking device is provided for safe and easy starting. The front roller is 2 feet 4 inches in diameter by 3 feet 6 inches wide, and the rear wheels 3 feet 6 inches.



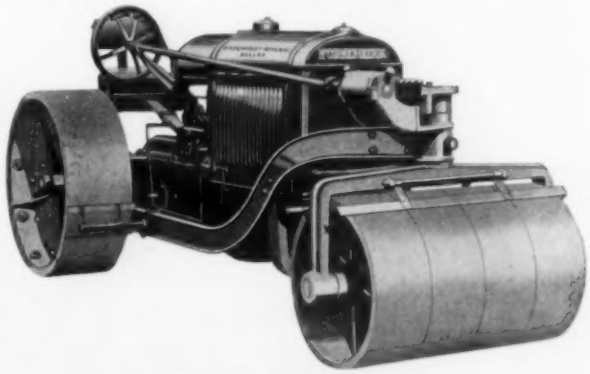
A DUPLEX GRADER EQUIPPED WITH A McCORMICK-DEERING TRACTOR

Autocar Receives Truck Order from Navy

Autocar Company, Ardmore, Pa., announces that it has been awarded an order for twenty-one heavy-duty chassis by the United States Navy Department, for delivery to prominent naval stations throughout the country.

Mosteller Died While Attending Convention

W. P. Mosteller, New England sales representative of the United States Pipe and Foundry Co., of Burlington, N. J., passed away suddenly at the Hotel Statler in Boston while attending the 50th annual convention of the New England Water Works Association. Mr. Mosteller joined the U.S. Pipe and Foundry Co. in 1918, after having been in the employ of several other pipe companies for short periods.



THE DAVENPORT-WINCHELL ROLLER

Convert your trucks into efficient snow removal units, by attaching

FRED *Gettelman*
HI-SPEED SNOW PLOWS

Write for Circular

The GETTELMAN Hi-Speed Snow Plow is already well known to cities, towns and villages, park and cemetery departments, etc. Now *this special Light-Weight model* is available, for use on a 1½-ton truck. It has two outstanding features: ample strength, and the correctly curved GETTELMAN blade, which rolls the snow up and out, and enables the truck to proceed at a normal rate of speed.

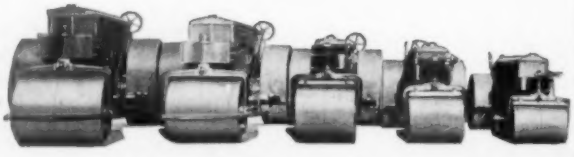
MADE IN THREE SIZES TO FIT ANY MAKE OF TRUCK

8 ft. plow for 1½-ton trucks
9 ft. plow for 2½-ton trucks
10 ft. plow, 3½- to 5-ton trucks

FRED GETTELMAN COMPANY, 4400 State Street, Milwaukee, Wisconsin

BUFFALO-SPRINGFIELD

THE RIGHT ROLLER FOR THE RIGHT JOB



The Buffalo-Springfield Roller line covers an exceptionally wide range of models and sizes. Whether for the heavy compaction demanded in the construction and maintenance of municipal streets, or for light compression work in public parks, on tennis courts, etc., there is a Buffalo-Springfield model to do it to the best advantage.

Built in weights from 2½ to 17 tons. Three Wheel and Tandem. Scarifier and other attachments optional.

THE BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO., U.S.A.

The Home Hotel of New York

Homelike in service, appointments and location . . . away from noise and congestion, yet but a few minutes from Times Square . . . . garage facilities for tourists.

Home folks will like this hotel

HOTEL
BRETTON HALL
BROADWAY at 86th STREET
NEW YORK

A CROSS-SECTION OF THE TURTLE-BACK LOADOMETER

A New Type of Portable Scale for Weighing Trucks

An improved design of the Drive-On Loadometer for measuring the loaded weight of all trucks, trailers, busses and tractors, has been announced by The Black & Decker Mfg. Co., Towson, Md. This piece of equipment is used principally in the enforcement of existing weight laws governing the use of motor vehicles on highways and streets. Known as the Turtle-Back Drive-On Loadometer, it is reported to be more accurate than any previous type. The turtle-back type of platform completely covers all the mechanism, preventing dust, moisture, water, tar, mud or other foreign matter from reaching the operating parts, thus assuring accuracy.

Two cams support the platform and hold it above the mechanism until the wheel comes to rest on the platform. This method of controlling the wheel load insures accuracy by preventing transmission of wheel impact or thrust to the recording mechanism. Further, the inclined ramps of the new type Loadometer are an integral part of the weighing platform, thereby making it possible to accommodate the large balloon tires now being used on many motor vehicles. The platform, which measures 11 x 20⅝ inches, will easily accommodate the largest balloon tire, which is 13.50 x 24 inches, as well as any size of solid tire.

The Loadometer is made of a heat-treated aluminum alloy, giving maximum strength with minimum weight. The complete outfit consists of two Turtle-Back Drive-On Loadometers packed in a handy carrying case. They are furnished in load capacities of 7,000, 15,000, and 20,000 pounds, 3,500 and 7,000 kilograms and 7 long tons.

A New Light Drill-Sharpening Machine

Heretofore many contractors, quarrymen and public works departments have been forced to depend on hand-blacksmithing for sharpening rock-drill and hammer-drill steel, because the small amount of work required would not warrant the purchase of a heavy-duty drill-sharpening machine. The Sullivan Machinery Co., 814 Wrigley Bldg., Chicago. Ill., has announced a class-E sharpener designed to bring the advantages of mechanical sharpeners to the group mentioned above. The new sharpener makes cross or rose 6-point bits to 2½ maximum gage on ⅞-inch or 1-inch steel. It forges collar shanks, and dies are available for any steel section. In addition, it forms and sharpens concrete-breaker pick or chisel bits on steel as large as 1⅛-inch hexagon.

This new sharpener weighs only 350 pounds and occupies a floor area only 18 inches square. The machine stands 4 feet in over-all height, and operates satisfactorily with no other foundation than that provided by bolting it to the floor or to light timbers. The portability of this sharpener, which has been named "Little Smithy," makes it possible to carry it with rock-drilling tools and a portable air compressor, and it can be readily disassembled for animal portage in rough country.

The sharpener employs the all-hammer principle, its upsetting and vertical hammers being operated by compressed air. The steel is held in the clamp for upsetting by a foot lever and toggle, which permit rapid action and provide a secure and positive grip on the steel. It is reported that this sharpener is economical in the use of air, being operated from a portable compressor without pulling down the pressure at other tools.

THE NEW SULLIVAN "LITTLE SMITHY" SHARPENING MACHINE

Machine-built "Metal Shoulders"

With the adoption of a new highway-shoulder specification in Indiana, requiring what are called "metal shoulders," a development to take care of the requirements of this specification has been made in the Insley shoulder finisher manufactured by the National Equipment Corporation, Insley Division, Indianapolis, Ind. This type of shoulder requires the excavation of a trench along the edge of the pavement, 6 inches deep, 6 inches wide at the bottom and 18 inches wide at the top. The trench is filled with crushed stone or gravel. This provides a shoulder close to the slab, of such a material that a motor-car can safely run off the edge of the slab without becoming mired or forced out of control.

To meet this requirement the Insley shoulder finisher is built with an extra blade attached to the inner end of the main blade. When the main blade is set at the proper angle, this extra blade scoops out a trench of exactly the required dimensions, a job which would otherwise have to be done by hand.

Other features of the Insley shoulder finisher include a slope blade which can be racked in or out and changed to any angle or back slope. Another feature is the guide bar which runs along the edge of the concrete slab and takes the side draft imposed on the machine by a heavy blade full of dirt; it also automatically fixes the dimensions from the edge of the slab to the edge of the shoulder.

A leveling device is furnished on the main blade, which, once properly set, gives the correct elevation of the outer edge of the shoulder in relation to the slab without the necessity of grade stakes being furnished for this purpose by the project engineer.

THE IMPROVED INSLEY SHOULDER MACHINE, SHOWING THE "METAL" TRENCH CLOSE TO THE SLAB, AND THE SLOPE BLADE AT THE RIGHT

Hanline Appoints Twelfth Foreign Agency

Hanline Bros., Baltimore, Md., manufacturers of Zonemark traffic paint, which dries in six minutes and which may be applied by brush or by machine, have announced the appointment of their twelfth foreign agency. Giacomo Primi has been appointed representative for Italy and the colonies. This action was taken after the exhibition of Hanline special zone paint at the International Traffic Exposition at Milan.

Sullivan Machinery Co. Appointments

The Sullivan Machinery Co., 814 Wrigley Building, Chicago, Ill., has announced the appointment of Leon J. Cone as its District Manager at Duluth, succeeding Jonathan A. Noyes, who has been promoted to Manager of the company's coal machinery sales division, with headquarters at the general sales offices in Chicago.

Suitable Servicised Expansion Joints for every condition—

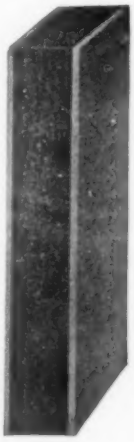
HOT — COLD — WET — DRY

TYPE B

WHAT are Servicised Expansion Joints?—They are premoulded safety strips which protect concrete roads and other concrete structures against cracking and self destruction due to temperature and moisture variations. They are produced from specially refined asphalts to which fibers are added for elasticity and reinforcement, after which they are formed hot under pressure into the required shapes.

WHY use Servicised Expansion Joints?—Because the initial expense is small, and the money saved by their use is considerable. Of what use is it to build a concrete road which will soon crack and require repairs? Servicised Joints are insurance against premature aging and cracking.

Two types are here illustrated: **Type "B"**—made of special quality asphalt and selected fibers, very low in moisture absorption, and with unusual conformity to expansion and contraction movements together with maximum control of oozing, and **our Reinforced Expansion Joint** developed for requirements demanding rigidity and strength in fillers, having a core of fiber heavily saturated with high-quality asphalt and reinforced on both sides by sheets of saturated felt.



REINFORCED

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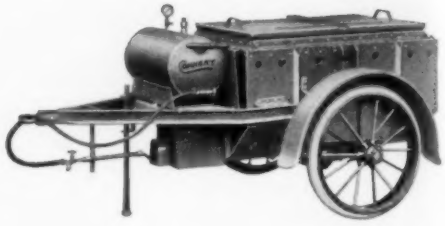
Telephone: Grove Hill 0423

SERVICISED PRODUCTS CORPORATION

6051 W. 65th Street Chicago, Ill.



Quality built— for heavy service

Thousands of Connery Kettles in use throughout the world have proved by long and satisfactory service that they are substantially and efficiently built.

Highway departments have found them to be not only excellent equipment, but an actual investment—for their long lives of trouble-free performance insure an absolute minimum of operating and maintenance cost.

Connery Kettles are available in all sizes and types to meet your requirements. WRITE TODAY for the Connery "BLUE BOOK" illustrating our complete line.

CONNERY & CO., Inc.

4000 N. Second Street

PHILADELPHIA, PA.

HONHORST TAR HEATERS

"Built for service"

ALL STYLES

Portable and Stationary

25 to 200 gallons

See our page in Street Construction Section, Municipal Index, for the Kettle you need.

Write for Pamphlet No. 15 on the New Oil Burning Heater

THE JOS. HONHORST CO.

1016 W. 6TH ST. CINCINNATI, O.

ACCOMMODATIONS FOR *TWO* IN A DOUBLE BEDDED ROOM at the USUAL SINGLE RATE! . . $3.00 to $5.00 Daily

600 Bright, sunlit rooms . . . each with bath, electric fan, and ice water. Adjacent to every activity.

HOTEL PICCADILLY

45th ST. WEST OF BROADWAY

New York

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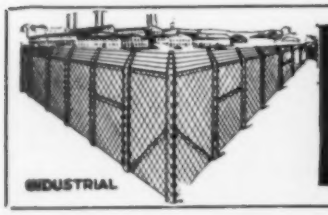
Lay Split Hickory Fibre

for street cleaning brooms is made by special-built machinery which insures higher grade product. A trial will convince you. Write us for prices.

THE LAY MANUFACTURING COMPANY

DALLAS J. G. Carrier, *Manager* NORTH CAROLINA



INDUSTRIAL

SWEET'S STEEL POSTS

Rolled from the highest grade Carbon steel --- easy to drive --- self contained --- with pleasing appearance and high safety factor.

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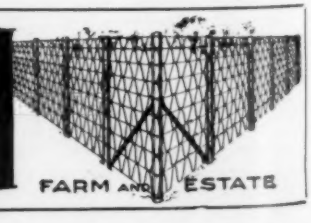
WILLIAMSPORT, PA.



FARM AND ESTATE

A WALTER SNOW-FIGHTER

Removing Snow from Roads at Cruising Speed

Highway snow-fighting frequently presents difficult problems owing to the deep accumulations of snow at frequent intervals, in spite of the best-known methods of snowdrift control. In order to successfully meet these conditions, it is necessary to have large, powerful snow fighters that have the traction and power to run through the deepest snowdrifts that may be encountered, and at the same time the unit must be capable of making high speed in plowing from drift to drift.

Walter Snow-Fighters, made by the Walter Motor Truck Co., Inc., Queens Blvd. at 37th St., Long Island City, N.Y., have positive drive on all four wheels. This is made possible because of the patented automatic-lock differential. The truck holds the road without stalling or side-slipping. The 130-hp., 6-cylinder-motor with the 10 to 1 range transmission provides great power for practically any snow condition.

Positive control of direction is made possible by the balanced construction of the unit and the unique Walter suspended drive. From 3 to 4 feet of snow can be cleared at 20 miles per hour, and lighter snow can be removed at speeds as high as 30 miles per hour. The front plows, which pour the deep snow off the road, also turn over high snow banks. The side wings cut down high snow banks and give a wide clearing. The pressure center-scraper blade cleans all packed snow down to the road surface.

An Outfit for Painting Traffic Stripes on Highways

A highway striping outfit which is used for spray-painting a traffic line stripe on highways and city streets has recently been brought out by The De Vilbiss Co., Toledo, Ohio. This Type HS outfit has been developed to meet varied conditions and will operate at a speed of from 6 to 8 miles an hour. About 7 gallons of paint is used for each mile of striping, depending upon the kind of material used, the thickness of the coating desired, and the surface of the pavement.

The marking outfit can be attached to either the right or the left running-board of a truck or can be used as a trailer from the rear of a truck. While it is substantially built for its purpose, it is light enough for one-man handling in loading and unloading and attaching to the truck. A special toggle-type joint with spring tension frees the striping outfit from the vibration or jarring of the truck. Road jars are absorbed by the rubber tires on the equipment. The running-board type striper is fastened to the truck by a clamping arrangement which also holds the horizontal drawbar in position. The design of the equipment permits of adjustment for various heights of running-boards. The operation of the striper does not obstruct traffic. In intermittent striping or in going from one job to another, the outfit can be lifted by a chain or rope from the operator's position on the truck, thus permitting the driving of the truck at greater speed between jobs.

The trailer type striper is similar to the running-board type except that it has a vertical drawbar and bracket with a clamping arrangement to fix the drawbar at various heights. The bracket is bolted to the truck floor, and the adjustment permits fastening and holding the striper in a level position on trucks of different heights.

The automatic spray gun is mounted on an arm between two metal discs. These discs insure a uniform stripe and are adjustable from a 4-inch to a 6-inch width. The spray gun arm is swung in a horizontal position or taken out if necessary for adjustment or cleaning of the spray gun. The discs are kept free from paint accumulation by a set of self-adjusting scrapers. The excess paint is deposited in the drip pan, and can be strained and used again in the paint tank or for hand painting at intersections. The spray gun is operated by a hand control valve mounted wherever it is most convenient for the operator.

THE DE VILBISS TRAFFIC STRIPE MARKER

Marking Safety Islands with Torches

In Montreal the winter storms do not permit of island safety zones being used and therefore permanently wired or equipped with acetylene markers. The zones must be of the removable type so that when snow-plows and mechanical sweepers have to be rushed into service the zones may be readily moved to the sidewalk or up to convenient locations, allowing full right-of-way for the snow-removal equipment. The time consumed during this operation is negligible compared to what would be required if manual labor were used to remove snow around the zones by hand shoveling. It was therefore necessary to offer some better suggestion than the coal oil or kerosene lanterns in use. The Van Gilder Sales Co., Montreal, Que., distributors of Toledo torches made by the Toledo Pressed Steel Co., Toledo, Ohio, developed a novel method for overcoming the difficulty.

BOMB TORCHES MARKING A SAFETY ZONE IN MONTREAL, QUE.

Several special standards were constructed and on them were mounted Toledo torches, as illustrated. That the idea has considerable merit is shown by the actual results which have been demonstrated. At one of the most hazardous zones, the torch equipment was tried out for a period of one week, and during that time not a single accident occurred, although this zone had accounted for at least one and often two or three accidents each night. The torches are being used in this manner in many other locations in Montreal and it is expected that this manner of protecting street safety zones will be adopted by the local officials quite generally during the coming winter season.

For Sale — A Bargain For Some City

This complete asphalt paving plant, used only 6 weeks, for sale at 2/3 original price. Capacity 250 tons per day. First class condition. New machine guarantee. Fully portable. Oil Burners. Term payments if desired. Complete description on request.

A Way to Use Local Labor

Other products—Oil Burning Surface Heaters, Fire Wagons, Tar Kettles, Concrete Mixer Heaters, Kerosene Torches. Write for illustrated catalogs.

Chausse Oil Burner Company

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PUBLIC Service Men, Street Repair Men—we present the HanDeeBox, a tool box made to stand the terrific abuse given equipment in street repair and water works service.

It is of All-Steel Construction—much stronger than a wooden box, but lighter in weight. Keeping tools in this box is like putting them in a SAFE!

Let us tell you all about the HanDeeBox. Write for Bulletin No. G-6.

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CINCINNATI, OHIO

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ADMIRABLY located in the heart of Boston's Back Bay district. This four hundred room hotel offers the traveler deluxe accommodations at moderate rates.

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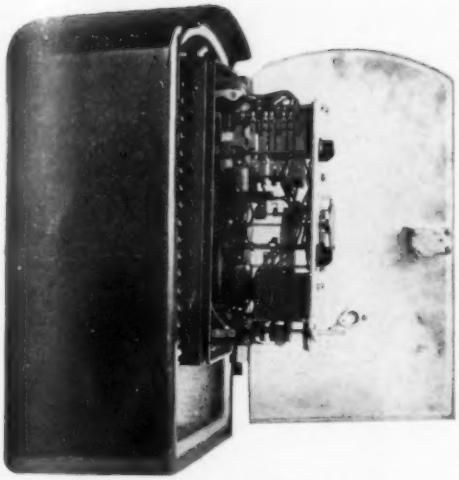
A Philadelphia Welcome . . .

that fine hospitality for which this old town is noted, awaits you at this famous doorway . . . ALL the comforts and luxuries of living at your command in the actual center of every interest.

The
BELLEVUE STRATFORD

RATES AS LOW AS $4.00 PER DAY

Claude H. Bennett, General Manager



THE MOUNTING OF THE NEW EAGLE COORDIPLEX TRAFFIC CONTROLLER

A New Traffic Controller Which Gives Greater Flexibility and Can Be Used with Older Equipment

A traffic controller which employs several novel features and which is made substantial and at the same time with greater flexibility has been introduced by the Eagle Signal Corporation, Moline, Ill., in the new Coordiplex controller. It is now possible with this controller to handle all of the common color cycles for either two or three like signals. Flashing night light contacts are part of the standard equipment. The controller is supported in a cabinet so that it may be withdrawn entirely while still supported on its holding studs, for examination and adjustment. This is accomplished without the addition of any jacks, spring contacts, or other unnecessary connections into the circuit, thereby minimizing opportunities for contact trouble.

The number of gears is held at a minimum, and no gear shifts are made in varying the cycle lengths. With no parts added to the standard local controller, the Eagle Signal Corporation is now prepared to provide systems which will continue to give synchronized operation of lights in the event of power failure at the master controller. They are also prepared to furnish systems in which extra-heavy traffic conditions may be met by increasing the percentage of green showing to the busy street or by shifting the green periods showing the busy street with respect to each other, or by a combination of both. These features are accomplished without the addition of a single extra part to the standard local controllers.

In the development of the new Coordiplex, special thought has been given to the customer of past years, and accordingly the latest Coordiplex unit may operate in harmony with the earlier Coordiplex systems of several years ago, and the customer is not obliged to pay anything extra to procure a controller of the very latest design for service on an old system.

A Locomotive Type 2½-Ton Crane

A locomotive-type crane of moderate capacity, intended for use in storage yards and by water supply and other municipal departments, as well as by highway and subway contractors, has been developed by the Silent Hoist Winch & Crane Co., 762 Henry St., Brooklyn, N. Y. The design and construction of the Krane Kar permits full-rated loads to be raised and lowered and swung from side to side, boomed up and down and transported over considerable distances. The crane will pass through openings as narrow as 5½ feet and as low as 7 feet. The rated capacities of the Krane Kar are from 5,000 pounds at a 5-foot radius to 2,500 pounds at a 10-foot radius. The rated capacity loads may be swung through 180 degrees.

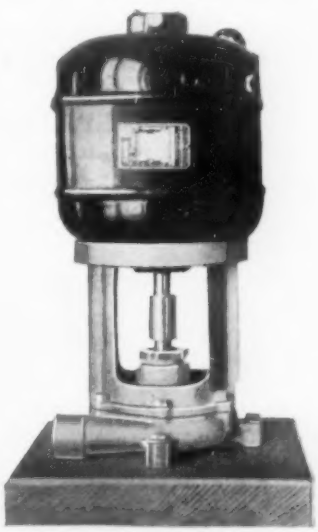
THE KRANE KAR

The traction wheels are in front, where they also support the load hanging from the hook. The Krane Kar is steered by the rear or trailing wheels. This arrangement permits easy steering when the crane is loaded. The mounting of the rear wheels is of the caster type, so providing a three-point suspension for the entire chassis. With the heavy front wheels, the location of the power plant, and the crane-operating mechanism and counterweight, stabilizers, outriggers, jacks or similar devices are not required.

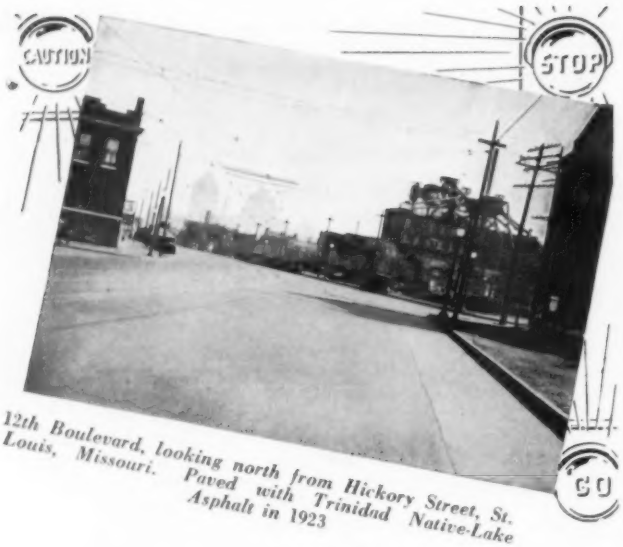
As the boom seat is located directly over the front axle, the entire boom length is useful to provide a large effective working range. Power for operating the crane mechanism is obtained from the gasoline engine by a roller-chain drive from a two-speed power take-off attached to the transmission. There are separate winches for the load and boom lines. The winches are so constructed that power is applied to lower the load as well as to raise it. The boom-swinging mechanism includes an enclosed worm-gearing and built-in reversing clutch unit, the same in size and design as that used for the winches. The gasoline engine power plant is of ample size to do the work for which the crane is rated; to provide reasonably high road speed when necessary to move long distances; and for traveling over roads both good and bad. The engine is equipped with an electric starter, a generator, storage battery, electric headlights, taillight, and electric horn.

A New Intermediate Tractor

Another member of the Caterpillar Tractor family, the Caterpillar Fifty Tractor, has been announced by the Caterpillar Tractor Co., Peoria, Ill. Between the Thirty and the Sixty in size, it fills a gap in the power range. It develops 50 maximum drawbar horsepower, and its shipping weight is approximately 16,500 pounds. In general appearance the Fifty follows the lines of design of the three smallest sizes in the Caterpillar tractor line—the hood enclosure for the engine, fuel tank just behind the engine, a wide cushioned seat for the driver, and all controls conveniently placed and within easy reach. There are four speeds forward and one in reverse. The speeds in miles per hour are: first, 1.6; second, 2.4; third, 3.4; fourth, 4.7; and reverse, 1.9. The area of ground contact with standard track shoes is 2,456 square inches. The tractor measures 146¼ inches in length, 75¾ inches in height, and 78⅞ inches in width. The ground clearance, measured from the lower face of the standard track shoe, is 11¼ inches. The drawbar is located 15½ inches above the ground. The lateral movement of the drawbar, measured at the pin, is 25½ inches. The Caterpillar Fifty has a 65-gallon fuel tank.



THE VIGILANTE PUMP FOR DEEP OR SHALLOW WELL WATER SUPPLIES



12th Boulevard, looking north from Hickory Street, St. Louis, Missouri. Paved with Trinidad Native-Lake Asphalt in 1923

Heaviest traffic street in St. Louis paved with Trinidad

Three powerful forces — traffic, time and weather—test the wearing qualities and endurance of a paving material. St. Louis will testify —as will thousands of cities throughout the world—that Trinidad makes good on all three tests.

That's because Trinidad gets its durability and its tenacity from *Nature.* Centuries of seasoning gives Trinidad its unique ability to withstand the ravages of wear and weather—as well as a resiliency which absorbs shock, lessens noise and makes it easy to clean and economical to keep in repair.

For Road Building—we recommend another Native-Lake product — Bermudez Road Asphalt. Write for proof of its worthiness.

THE BARBER ASPHALT COMPANY

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New York · Chicago · St. Louis · Kansas City · San Francisco

TRINIDAD NATIVE LAKE ASPHALT

WOOD hoist *holds* body at any dumping angle!

A Wood hoist and body installation is pictured, spreading tep dressing. A ball-check pump holds the body at any desired angle, while the truck is in motion. The tailgate spreading device allows even material distribution. Smooth floor permits clean discharge. And all-steel construction gives long life. *All Wood equipment sold under life time guarantee. Write for literature.*

WOOD HYDRAULIC HOIST & BODY CO.
DETROIT, MICH.

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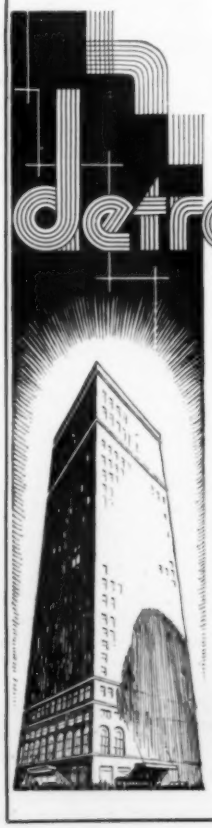

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Luxurious, soft, inviting beds~Charming room arrangement~Unobtrusive service~Compelling splendor in dining room and coffee shop with electrically cooled and purified air~An address to mention with pride.

800 ROOMS

all outside and all with private bath~at no more than the cost of an ordinary hotel.

Single $2.50 *and up*
Double $3.50 *and up*

BAKER OPERATED

IN THE HEART OF

DETROIT

CASS AND BAGLEY AVENUES

Asphalt Institute Foregoes Annual Conference

The Board of Directors of The Asphalt Institute, 601 Second Avenue, New York, has announced that with regret it is to forego the holding of the Tenth Annual Asphalt Paving Conference this year. The present business situation has brought about conditions which the management of the Institute feels might render it difficult or burdensome for engineers and officials to meet the expense of devoting a week to this Conference, even though it has come to be recognized as one of the most instructive institutions to which engineers have access in the working-out of their problems. This decision was reached solely from the standpoint of what is best for those who customarily attend the Conference and not on any account as a curtailment of the activities of The Asphalt Institute.

Within the past thirty days the Institute has been tremendously strengthened and its scope very greatly broadened by the addition to its membership of the following important producers: Standard Oil Co. of California; Union Oil Co. of California; Shell Oil Co.; Indian Refining Co.; Associated Oil Co.; Gilmore Oil Co.; and Colonial Beacon Oil Co. At least two other important oil companies are expected shortly to join the Institute. It is expected that with these accessions to its membership the Institute will greatly increase its research and standardization work and will endeavor to extend its usefulness as an educational factor through the medium of its publications, its engineering staff and its contact with the engineering and general press.

The 1932 Asphalt Paving Conference will unquestionably make up for the omission of this year's Conference, as nothing will be left undone to make it supreme in every respect.

High-Speed Snow-Plows for Light Trucks

A high-speed, easily detached 7-foot snow-plow has been developed by the Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill., for use on Ford AA or Chevrolet 6-cylinder trucks. This snow-plow meets the needs of counties and towns that own small trucks. It can be used in congested districts, airports, etc., where a small, fast-moving and inexpensively operated snow-plow is necessary.

The blade is 7 feet long and has a cutting width of 5 feet 9 inches. It is made of 3/16-inch steel plate reinforced vertically by five 2½ x ¼-inch angles and horizontally by flanging the blade. The blade is 18 inches high at the inner end and slopes to 30 inches at the outer end. It is fixed at an angle of 35 degrees in relation to a line running at right angles to the center lines of the truck. A renewable bit, 6 x 3⅜ inches x 7 feet, of high-carbon steel, is securely bolted to the blade and takes the wear off the cutting edge. A spring release, operating automatically, permits the blade to pass over any obstacle without damage. Control of the blade lift is through a cut worm and gear and lifting chain. The hand wheel is located immediately behind the worm on the push frame.

The blade is pivotally attached to the front lifting frame to accommodate the spring release, and the lifting frame is pivotally connected to the push frame to allow it to be raised for transportation. The frame consists of four 3 x 3 x ½-inch angles, two on each side of the truck, bolted together back to back. A series of bolt holes allows adjustment to truck frames of different lengths. The rear angle is attached to the truck by 5 x 5-inch steel plates bolted with J bolts to the channel-shaped side sills of the truck frame. The ⅝-inch steel rods, fastened to the plow beams and to the front end of the truck, hold the frame of the plow steady and in the center of the truck frame.

West Rejoins Permutit

After about a year and three-quarters as Manager of Sales of the Paradon Company, Francis D. West has returned to The Permutit Company as District Sales Manager, with headquarters at 712 Brisbane Building, Buffalo, N. Y. Mr. West was associated with The Permutit Company from 1918 until 1930 and has had very broad experience in the treatment of industrial water supplies.

THE WESTERN SNOW-PLOW MOUNTED ON A CHEVROLET TRUCK IN RAISED POSITION FOR TRANSPORTATION WHEN NOT IN USE

Ash and Garbage Cans with Nestability Feature

A GROUP OF NESTED ASH CANS

Galvanized ash and garbage cans which are designed to nest up to the handles, making it possible to store three to six times as many cans in the same floor space, are made by the Reeves Manufacturing Co., Dover, O. These cans have corrugated sides, with heavy handles which are specially designed to prevent strain on the handle rivets and to obviate pinching the fingers. The bottoms are raised and concave and are tightly double-seamed to the body so as to leave no cracks, crevices, open seams, bulges or protrusions to retard clean dumping. Some of the models, including the Super, Vulcan, Monitor, Atlas, Dependable, Capital, Engineers and Samson cans, are constructed with special top and bottom reinforcing rings to make them still more durable in spite of rough handling.

Reeves ash and garbage cans are made in a variety of styles and sizes to meet the requirements of any municipal garbage and refuse collection departments.

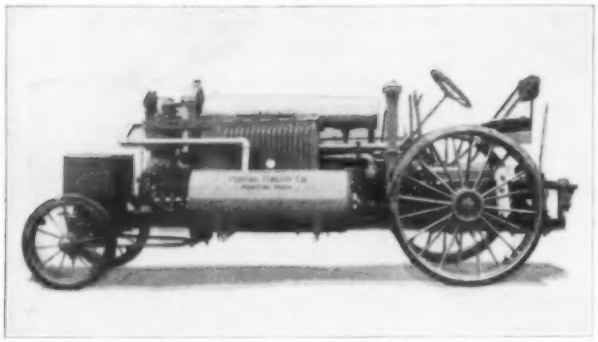
Cutting Diesel-Engine Costs with New Machinery

At a cost of over $100,000, the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, Mo., is having built a special large tool for diesel-engine construction that will combine three machine operations in one set-up. This tool, partly because it is fitted with a larger electric motor, will probably double the output of the man who runs it, and justify an increase in his wages. The lowered cost will enable the manufacturer to sell more diesel engines, and will result in the employment of more workers.

The use of this tool in diesel-engine construction follows the lead of the automobile industry, which has reached its present peak through better design and speedier tools capable of more operations. The increasing inquiries for economical diesel engines from all branches of industry confirm the fact that the first drastic cutting of overhead is being followed by capital expenditures to reduce costs, according to the Busch-Sulzer Bros.-Diesel Engine Co.

Consolidation of Executive and Sales Offices

Reading Iron Company, Reading, Pa., has announced the consolidation of its general executive and general sales offices in the Terminal Commerce Building, 401 North Broad Street, Philadelphia, Pa. The new offices are on the tenth floor.



THE PONTIAC SELF-PROPELLED AIR-COMPRESSOR

A Self-propelled Air-Compressor

A self-propelled four-wheel air-compressor, capable of hauling other equipment behind itself and moving to, from and ahead on the job under its own power, is made by the Pontiac Tractor Co., Pontiac, Mich.

Power is taken from the tractor to drive the Quincy W-4 duplex single-stage water-cooled compressor through the power take-off pulley, which has a clutch allowing it to be thrown in or out of gear at will. The "ahead" drive brings the belt tightener into correct relation with the belt.

The Pontiac backfiller winch is mounted on the frame at the side of the tractor and takes its drive through a chain from the power drive-shaft at the rear. It is a single-drum type winch with clutch and brake and is operated from the driver's seat by a lever. The compressor and the winch can be operated separately or together, which permits backfilling and tamping at the same time.

A separate radiator with pump-driven circulation is mounted for the compressor, insuring air at low temperatures from the compressor and adding to the efficiency of the machine.

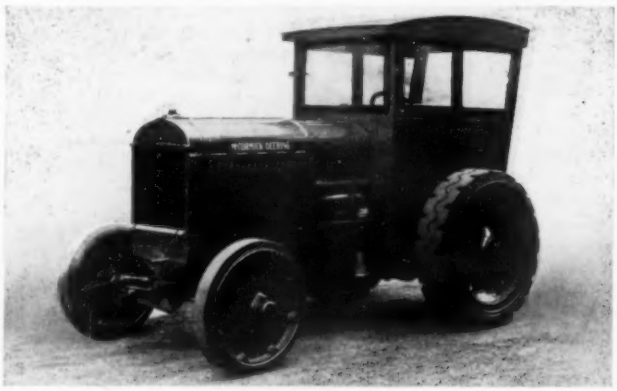
The compressor has a three-bearing crankshaft and a force-feed oil system to all bearings, which permits the machine to be operated without jacking it to level. A large air receiver allows an even flow of air to the tools at all times. The unit is controlled by a Penn unloader with hand unloader attachment. The capacity of the unit is two busters, four spades, four riveters or two tampers. The power plant is a McCormick-Deering Model 20 industrial tractor.

Tractor Cabs for Winter Work

A cab which is built with heavy oak sills and corner posts reinforced with steel, so that it will stand up under the Highland Body Manufacturing Co., Elmwood Place, Cincinnati, Ohio. The panels and dash of the Highland cab are of 14-gage steel The roof is of composite construction, made of three-ply wood panels covered with steel in one piece. The windshield is of a special tractor design, having a heavy steel frame T section, covered with rubber molding that flexibly supports the polished plate glass and also serves as a seal, so that when closed it is weathertight.

The windows above the panels are separate units and can be removed entirely for summer use, if desired. The front sash is stationary, and the rear sash is hinged and swings forward and can be securely locked in either open or closed position. The rear of the cab is closed with a curtain which rolls up into the roof.

All cabs are designed to be spring-mounted. They can be mounted on tractors without change, but it is desirable to move the seat over to the right about 2 inches to give the driver more room on the left side to reach his seat.



THE HIGHLAND CAB

Patrolling Gravel Roads

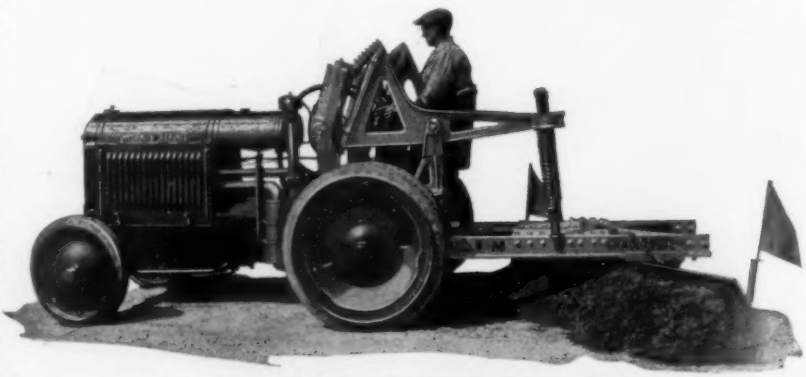
A quick-detachable, quick-turning and quick-manipulating patrol grader that may be turned around on most roads without backing, thus permitting quickly working-out bad spots without covering the whole patrol section, is made by the Landreth Machinery Co., Joplin, Mo.

This grader can be assembled on a McCormick-Deering tractor in approximately one hour without drilling any holes or changing any bolts in the tractor. After it is once assembled, the grader and operating mechanism may be detached from the tractor in ten minutes by pulling six large pins. It may be re-attached in the same time, making the tractor available for other work, if desired. Blade controls are in handy position on each side of the operator. Because of the pull and the peculiar leverage employed, the machine is very effective in cutting out pockets and corrugations and, as there is no charter or ripple, the machine does feathering and spreading very accurately.

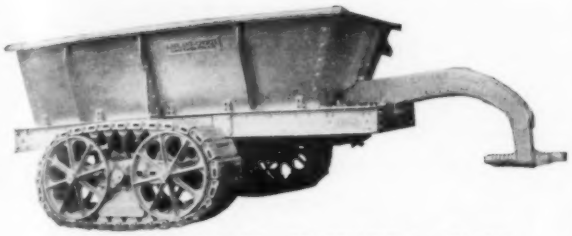
Plug Valves and Leak Clamps

The formation of the Timken Michigan Co., Detroit, Mich., has recently been announced. This organization will manufacture and sell a complete line of lubricated and non-lubricated plug valves and also a line of leak clamps for use on cast iron bell-and-spigot pipe. The new company takes over the patents and production of the screw-lift valve, which previously was manufactured by the Michigan Valve & Foundry Co. This valve is applicable in the control of fluids where pipe-line velocities or pressures are high.

Heading the new organization is R. J. Goldie, President. Mr. Goldie is also Vice-President and General Manager of the Michigan Valve & Foundry Co. Fred Glover, who is President of the Timken-Detroit Axle Co., is Vice-President of the new organization. W. C. Wood, Secretary and Treasurer of the Timken Detroit Axle Co., will serve as Secretary and Treasurer of the Timken Michigan Co. In addition to the above officers, the Board of Directors includes D. S. Devor, Vice-Pres. in charge of manufacturing of Timken-Detroit Axle Co., and W. F. Rockwell, President of the Pittsburgh Equitable Meter Co.



THE K-M GRADER PATROL FOR PATROLLING EARTH OR EARTH AND GRAVEL ROADS



A LA PLANT-CHOATE BOTTOM-DUMP WAGON EQUIPPED WITH ROADLAYER CRAWLER TRACKS

Crawler-equipped Bottom-Dump Wagons

A bottom-dump wagon, designed to carry 7 or 8 cubic yards of earth and equipped with Roadlayer crawler tracks, is now built by the LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa, being made entirely of steel, hot-riveted and electric-welded throughout. The frame is constructed of heavy section channels both riveted and electric-welded. The wagons have an arched, one-piece, box-type, cast-steel tongue made from special-alloy steel. A heat-treated pullbar bolt is provided, with a spring to absorb the jerks of starting where work is done by tractors, while an extra hole is placed in the tongue for use when operating the wagons in train. The tongue is bolted to the 21-inch wagon deck by 8 one-inch bolts, and also to the front wagon cross-tie by 3 one-inch bolts, thus giving it a secure connection to the wagon.

A cast-steel box is provided at the rear of the wagon through which the rear drawbar is fastened. The pullbar casting on the rear is the same as on the front. The hand-wind for the bottom-dump doors is an integral part of the winding drum and the trip ratchet. By combining these in one casting, the usual strain for winding up the wagon and for carrying the load is not carried from the shaft. A simple swivel-type step is provided on the left side, so attached that it will fold up under the wagon body when obstructions are hit. The step is made like an open gate so that it will clean itself of mud.

The high wagon tongue arch has been designed to afford the necessary clearance to permit full turning of the tractor. The rigidity of the one-piece casting enables the driver to back the wagon easily, and the curve of the tongue prevents it from coming into contact with the tractor or wagon to which it is attached. The wagons in train can turn at a 102-degree angle, making them flexible in close quarters. When hooked in train, the upper pullbar hole in the tongue is used, this pulling point being in a direct line and parallel with the line of force on the main frame, and also pulling in the center of it.

The winding cables for the doors are held in alignment by special tapered sheaves and brackets. The front equalizer sheave and bracket is hung on a spring-cushioned bolt to absorb the shock of the opening doors, and it also absorbs the jolts on the doors when heavy loads are dropped on them. The cable is one piece, dead ended on the winding drum, so the cable has equalized strain and both doors are drawn easily.

All LaPlant-Choate wagons are equipped with a hand-wind at the rear, including the hand-wind lever and trip lever. Provision is made on all hand-wind models so that when a hydraulic door-wind unit is specified, a projected shaft can be quickly coupled to it by means of a spline coupling. The hydraulic cylinder device is set on the right-hand side of the wagon. Use of the hydraulic hand-wind eliminates one man, increases the operating speed, eliminates the danger of a man's climbing on and off the wagon, and makes it possible to wind the doors practically instantly. The hydraulic hoist enables the tractor driver not only to trip the doors from his seat, but also to wind them up by merely pushing a lever.

A Snow-Plow for Light-Duty Trucks

A new model of the Gettelman Hi-Speed snow-plow which is designed for use on light-duty 1½-ton truck chassis has recently been announced by the Fred Gettelman Co., 4400 West State Street, Milwaukee, Wis. Trucks equipped with this plow can be placed in service soon after the snowstorm begins, and stay on the job until the storm subsides and the highway is cleared.

The Gettelman plow is simple in design and ruggedly constructed. The curved blade is 8 feet wide and 34 inches high, of ⅛-inch steel, with a reversible cutting edge of high-carbon steel. Structural steel angles reinforce the curvature of the blade and the cutting edge. The push arms are made of seamless steel tubing to afford maximum strength with minimum weight, and the tension type springs are easily adjusted to meet plowing conditions. The blade has but one position, which has been determined by careful tests.

The trip action of the blade protects the plow and truck from road obstruction. The blade is pivoted so that it can tip forward and the tension springs and the counterbalancing effect of the snow immediately bring the blade back to scraping position. The offset blade throws the pressure line to the rear of the steering knuckle of the front wheel. This action tends to keep the truck nosed toward the discharging snow rather than away from it. The offset blade also permits the truck wheels to remain on the pavement and still clear the snow beyond the edge of the paving. This Hi-Speed snow-plow, which weighs less than 650 pounds, can be installed in a few hours, by following a few simple instructions. Once the installation is made, very little time is required to attach or detach the plow. This equipment makes it possible to convert light-duty maintenance trucks into snow-removal units to keep streets and sidewalks open to traffic.

Littleford Opens Chicago Office and Warehouse

Littleford Bros., 500 East Pearl Street, Cincinnati, Ohio, have announced the opening of a Chicago office at 217 East Illinois Street, with Herbert M. Orschel as District Manager.

Buffalo Fire Appliance Corporation Completes Addition to Factory

A 60 x 120-foot two-story addition to the factory of the Buffalo Fire Appliance Corporation, 44 Central Avenue, Buffalo, N. Y., has just been completed. The second floor of this addition is being used for the offices. Apparatus sales have been increasing from year to year, and at the present time the Buffalo organization reports that they are considerably ahead of 1930. Recent sales have been made to Sunbury, York, Bellefonte, Bradford and Reading, Pa., Wolfeboro, N. H., and Weston and Lynn, Mass.

The Lynn 1,000-gallon pumper is the fourth machine of this size which that city has purchased from the Buffalo Fire Appliance Corporation in the past year. All the sales mentioned above were hteier 750- or 1,000-gallon pumpers and are reported to be working out satisfactorily.

A GETTELMAN PLOW ROLLING BACK A HEAVY SNOWFALL

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Detroit's Memorial Fountain Illuminated in Four Colors

THE Scott Memorial Fountain on Belle Isle, Detroit, Mich., a beautiful monument by day, now presents a brilliant and colorful spectacle at night, an appropriate addition to the civic scheme of Detroit. Several years ago, the City Planning Commission decided to illuminate the fountain so that its beauty might be admired at night as well as by day. Today streams of water spouting from the heads of lions, turtles, and other figures are transformed into colored liquid by numerous lighting units submerged in the water.

The fountain is a memorial to James Scott, who willed money to the city for that purpose upon his death in 1910. Eager to make the memorial a thing of architectural beauty, the City Planning Commission posted a prize of $10,000 in a design contest open to artists, sculptors, and architects. Cass Gilbert, New York architect, won the contest, and construction was started in 1921 by the John Bolin Company. In 1928 negotiations were begun to illuminate the fountain, and this summer the lighting system was placed in operation. At present the three main bowls of the fountain are lighted. Later the wide basin at the ground level will be illuminated with underwater units and the steps leading up to the fountain will be floodlighted.

BY DAY, A MONUMENT OF DIGNITY AND BEAUTY

BY NIGHT, A TOWER OF VARICOLORED LIGHT

Some idea of the size of the Scott Memorial Fountain may be gained from the accompanying illustration. The diameter of the entire fountain is 510 feet; that of the outer pool is 112 feet. From the lagoon to the top of the fountain measures 37 feet 9 inches; to the top of the vertical stream, when it is turned on at full force, 125 feet. There are 109 water jets in the fountain, which spout 7,700 gallons of water per minute.

Lighting in Four Colors

At the present, a total of 96 Westinghouse Aqualux underwater lighting units illuminate the spouting jets and the three bowls of water. The bottom bowl contains 32 1,000-watt units divided into four color groups, red, amber, green, and clear, eight units per group. The intermediate and top bowls also contain 32 units each, separated in four color groups of eight units each. In the color scheme for the two upper bowls, blue is substituted for amber. Only the units in the bottom bowl, however, are equipped with 1,000-watt lamps. The eight units in the intermediate bowl having clear lenses are equipped with 250-watt lamps; all others, including those in the top bowl, burn 400 watt-Mazda lamps.

A complete color cycle of all lighting occurs every 2 2/3 minutes. The change and overlapping of each individual color occurs every 20 seconds. Color cycles operate as follows:

Bottom Bowl	*Intermediate and Top Bowls*
Amber	Blue
Amber and green	Blue and green
Green	Green
Green and clear	Green and clear
Clear	Clear
Clear and red	Clear and red
Red	Red
Red and amber	Red and blue

The total connected load for the entire lighting system is 56.4 kilowatts.

Illuminated fountains may do much to enhance the beauty of a city. There is a growing trend towards large fountains designed in architectural beauty, and now, illuminated at night, they become distinctive landmarks to all tourists and instill civic pride in citizens.

ALFRED PAULUS,
Commercial Engineering Department, Westinghouse Lamp Co.

Floodlighting the Olympic Stadium

THE floodlighting system of outdoor illumination for spectacular nocturnal events in the Olympic Stadium, Los Angeles, Calif., differs from the usual floodlighting in that, instead of being mounted in towers and groups of projectors, the lamps are distributed around the rim of the structure in pairs and on poles, showering the area and seating-range with light as brilliant as daylight. The present lighting system, installed by the Foulkes Electric Co., of Los Angeles, is said to be of greater intensity than those in effect elsewhere.

The 196 projectors are divided up into 84 1,500-watt units, these being Crouse-Hinds spread-light lenses; and 112 500-watt units of the Novalux street-lighting type, the latter 56,000 watts being designated for general lighting inside and out. Designed for utilitarian purposes, the system provides 12 foot-candles as against the average eight candlelight. A control panel with 40 remote control switches, located in the office of the structure, is split up so that part of the lighting may be used if desired. Distributed in pairs approximately 35 feet apart, the floodlights, mounted on poles which also serve as flag standards, are 18 feet above the top of the stadium upper parapet wall and 120 feet above the field. For the lighting area in front of the peristyle, 10 500-watt units are employed, and 20 500-watt units for the peristyle itself.

Street Lighting, Salt Lake City, Utah

The new street lighting on Lower Main Street comprises some 112 Westinghouse Titan Luxsolites mounted on Giant Duplex cast iron brackets and equipped with 15,000-lumen lamps. The brackets are mounted on top of the trolley poles between 5th South and 9th South on each side of Lower Main.

HOW THE OLYMPIC STADIUM, LOS ANGELES, CALIF., IS LIGHTED FOR NOCTURNAL EVENTS

Four Types of Lighting Equipment Used in New Castle, Pa.

By **F. F. MILLER, City Engineer**

NEW CASTLE today has a well-balanced, effective and economical street-lighting system which is equaled in very few cities of the same size. This situation was made possible by the cooperation of a group of public-spirited and progressive city officials with the local electric service company. During the first six months of 1930 the street-lighting system was greatly improved and raised to a very high level of efficiency. The changes involved were extensive. For reasons of standardization and simplification, the number of different types of street-lighting equipment was reduced as far as practicable. The various streets of the city were classified as residential, arterial, main business district, or secondary business district, and a uniform type of street lighting was installed on all streets of the same classification.

Prior to 1930, part of the lighting equipment had been owned by the city, and the remainder had been owned by the electric service company. In order to unify the entire system, the former city-owned lighting equipment was purchased by the electric company. The latter now owns and operates all the street-lighting equipment under a contract whereby the city pays for all street lighting on a lamp-per-year basis. All street lights were placed on an all-night burning schedule, although formerly part of the business district lights were turned off at midnight. Lamps smaller than 250 candlepower were replaced with larger sizes.

The types of lighting equipment now in use throughout the city are:

Main Business District.—Single-light ornamental curb standards with 1,000-candlepower lamps, 90 feet opposite spacing and 14 feet mounting height.

Secondary Business Districts.—Same as above except with 600-candlepower lamps. In some cases trolley-pole or wood-pole brackets are used instead of standards for mounting street lights.

Main Traffic Arteries.—Pendant 600-candlepower street lights, mounted on 12-foot mastarms and approximately 20 feet above the street. Average spacing, 300 feet. This spacing is reduced where traffic is especially dense. Enclosing glassware is used.

Residential Districts.—Pendant 250-candlepower lights with 20-inch radial wave, open reflectors, mounted on 12-foot mastarms and about 20 feet above the street. Average spacing, 300 feet.

EAST WASHINGTON STREET, NEW CASTLE, PA.
A daytime view of the standards used in business districts

The total number of street lights under each classification is as follows:

	No. of Lamps	Candlepower
Main business district.....	106	1,000
Secondary business district..	162	600
Arterial streets.....	354	600
Residential streets.....	992	250
Total	1,614	

EAST WASHINGTON STREET AT NIGHT

The results of the improvement in the street lighting of New Castle have been gratifying. The flow of traffic through the city has been expedited and there has been a noticeable reduction in traffic accidents. Not only has the appearance of the city at night been enhanced, but the business districts have been endowed with a new brilliance and attractiveness after nightfall.

Aeronautical Lighting

THE Secretary of Commerce is authorized to certify all lights of aeronautical character, excepting those established and maintained on national airways by the Federal Government, if in his opinion such lights serve as true aids to air navigation. The "Regulations Governing Establishment and Certification of Aeronautical Light," which went into effect as amended September 1, 1931, are published in a bulletin (Aeronautical Bulletin No. 9, U. S. Department of Commerce), together with "Recommended Standards for Marking Obstructions to Air Navigation."

Buffalo's City Hall by Night and by Day

(See also the cover)

THE exterior of Buffalo's new $7,000,000 City Hall is floodlighted with 179,000 watts of light. Second in size only to the Los Angeles City Hall, the new Buffalo building was opened for occupancy in September, four months ahead of schedule. Its height of 371 feet makes it the tallest building in the city. The architecture is a modern adaptation of classical lines. Buff is the prevailing color, Ohio sandstone being used with pink Kasoto stone trim. Of the 32 floors, 27 are available for offices, two are used to house the necessary mechanical equipment, and the three top floors are an observatory.

The building extends 315 feet north and south across the west side of the Niagara Square Civic Center, and is 164 feet deep. The over-all floor area is 660,000 square feet, or about 15 acres. There are two 15-story wings on the east side of the building, and on the west are two four-story wings, so constructed as to permit the addition of more floors.

On the 13th floor is the Council Chamber, modern in character, resembling a Grecian amphitheater. It is illuminated by means of a sunburst skylight, and six decorative windows behind and above the Council President's chair. A gallery is provided for spectators. A maintenance staff of 99, with an annual payroll of $114,000, and a total maintenance bill of $190,000 yearly, are required to run the City Hall.

Dietel and Wade and Sullivan W. Jones, of Buffalo, were the architects, and the construction was in charge of the John W. Cowper Construction Co. The cover and the daytime view are reproduced through the courtesy of the Buffalo Chamber of Commerce.

Make your park a winter resort

—with floodlights

Winter nights will soon be calling your public to the robust delights of skating, coasting, skiing, and hockey.

But with all their possibilities, these sports are neither safe nor enjoyable unless there is abundant light—light that attracts and that maintains interest night after night—light that turns the park or playground into a veritable winter resort.

Whatever winter sports you feature, you can promote them best with General Electric floodlights; and you can use the same equipment for tennis, croquet, pageants—whatever is "doing" during the warm weather.

A floodlighting specialist from the nearest G-E office will be glad to tell you about some of the many successful G-E installations and to explain the economy and superiority of G-E equipment.

Typical installations of G-E floodlights for hockey, tobogganing, and skating

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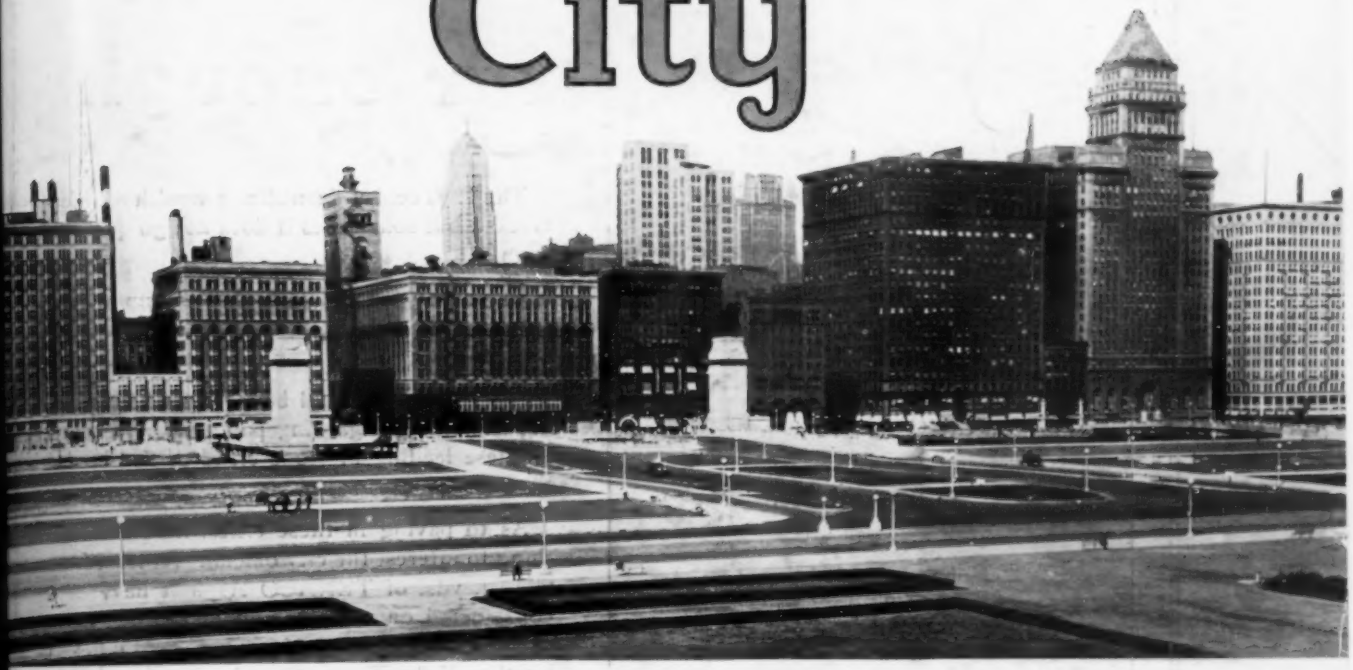
The American City